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WASHINGTON COUNTY CLOSED-CIRCUIT TELEVISION REPORT.
BY- LYLE, DAVID
WASHINGTON COUNTY BOARD OF EDUC., HAGERSTOWN, MD.
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DESCRIPTORS- *CLOSED CIRCUIT TELEVISION, *INSTRUCTIONAL TELEVISION, COSTS, *CLASSROOM RESEARCH, CURRICULUM, *EDUCATIONAL IMPROVEMENT, CLASS SIZE, AUDIOVISUAL AIDS, ACADEMIC ACHIEVEMENT, ELEMENTARY SCHOOLS, HIGH SCHOOLS, JUNIOR HIGH SCHOOLS, *STUDENT TEACHER RELATIONSHIP, TEACHER ATTITUDES, STUDENT ATTITUDES, EFFECTIVE TEACHING, RURAL URBAN DIFFERENCES, CONVENTIONAL INSTRUCTION, HAGERSTOWN, MARYLAND

THE INSTRUCTIONAL POTENTIAL OF TELEVISION WAS EVALUATED FROM 1956 TO 1961 IN THE WASHINGTON COUNTY, MD., SCHOOL SYSTEM. ALL GRADES AND ALL COURSES WERE INVOLVED. TELEVISED INSTRUCTION WAS MADE INTEGRAL TO THE COURSES, BUT IT DID NOT OCCUPY A MAJOR PART OF THE SCHOOL DAY. 45 SCHOOLS WERE LINKED IN A CLOSED-CIRCUIT TELEVISION NETWORK. SIX DIFFERENT LESSONS COULD BE BROADCAST SIMULTANEOUSLY TO OVER 800 SETS. LESSONS WERE TRANSMITTED, MOSTLY LIVE, FROM A TELEVISION CENTER WITH 5 STUDIOS. A TEACHING TEAM CONSISTED OF THE STUDIO TEACHER AND THE CLASSROOM TEACHER, WHO PREPARED STUDENTS FOR THE TELEVISED LESSON AND LED DISCUSSION AFTER IT. A SUBJECTIVE AND OBJECTIVE EVALUATION PROGRAM WAS CONDUCTED BY INTERVIEW, QUESIONNAIRE, AND EXAMINATION. STUDENT ACHIEVEMENT IN BASIC SUBJECT AREAS WAS MEASURED, NOTING DIFFERENCES BETWEEN ACHIEVEMENT IN URBAN AND RURAL SCHOOLS. AFTER 5 YEARS IT WAS FOUND THAT THE CURRICULUM HAD BEEN IMPROVED AND ENLARGED AT A FRACTICABLE COST. A MAJORITY OF STUDENTS AND TEACHERS LIKED TELEVISED INSTRUCTION. TABULATED RESULTS OF STUDENT ACHIEVEMENT IN MATHEMATICS, SCIENCE, SOCIAL STUDIES, ENGLISH, ART, MUSIC AND FRENCH GENERALLY FAVORED STUDENTS WHO HAD RECEIVED TELEVISED INSTRUCTION FOR A LONGER FERIOD OVER STUDENTS RECEIVING LESS OR NO TELEVISED INSTRUCTION. THE PROJECT WAS NOT CONDUCTED AS A FORMAL EXPERIMENT. (MS)

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washington county closed circuit television report

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hagerstown, maryland

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FOREWORD

A recent visitor to a Hagerstown school asked a pupil if he liked school better with television or without television.

"Why, we've always had television in school," he replied.

A similar reply would have been made by many pupils entering the eighth grade in September, 1963, because they have never known school without television as a regular part of their classroom experience.

The use of instructional television in county schools began in September, 1956, and has continued as an integral part of the instructional program.

The results of a five-year study, The Washington County Closed-Circuit Educational Television Project (1956-61), are described in this report. The project was sponsored by the Electronic Industries Association and the Fund for the Advancement of Education of the Ford Foundation, assisted by the Chesapeake and Potomac Telephone Company.

Since our school system had the unique opportunity to work with television in major subject areas at all grade levels in successive years, we are often asked to point out the most significant achievement of the project. While we may seem to oversimplify the findings, we believe that the use of instructional television has stimulated teachers, supervisors, and administrators to examine more closely the teaching-learning process and to pursue curriculum development with a new interest.

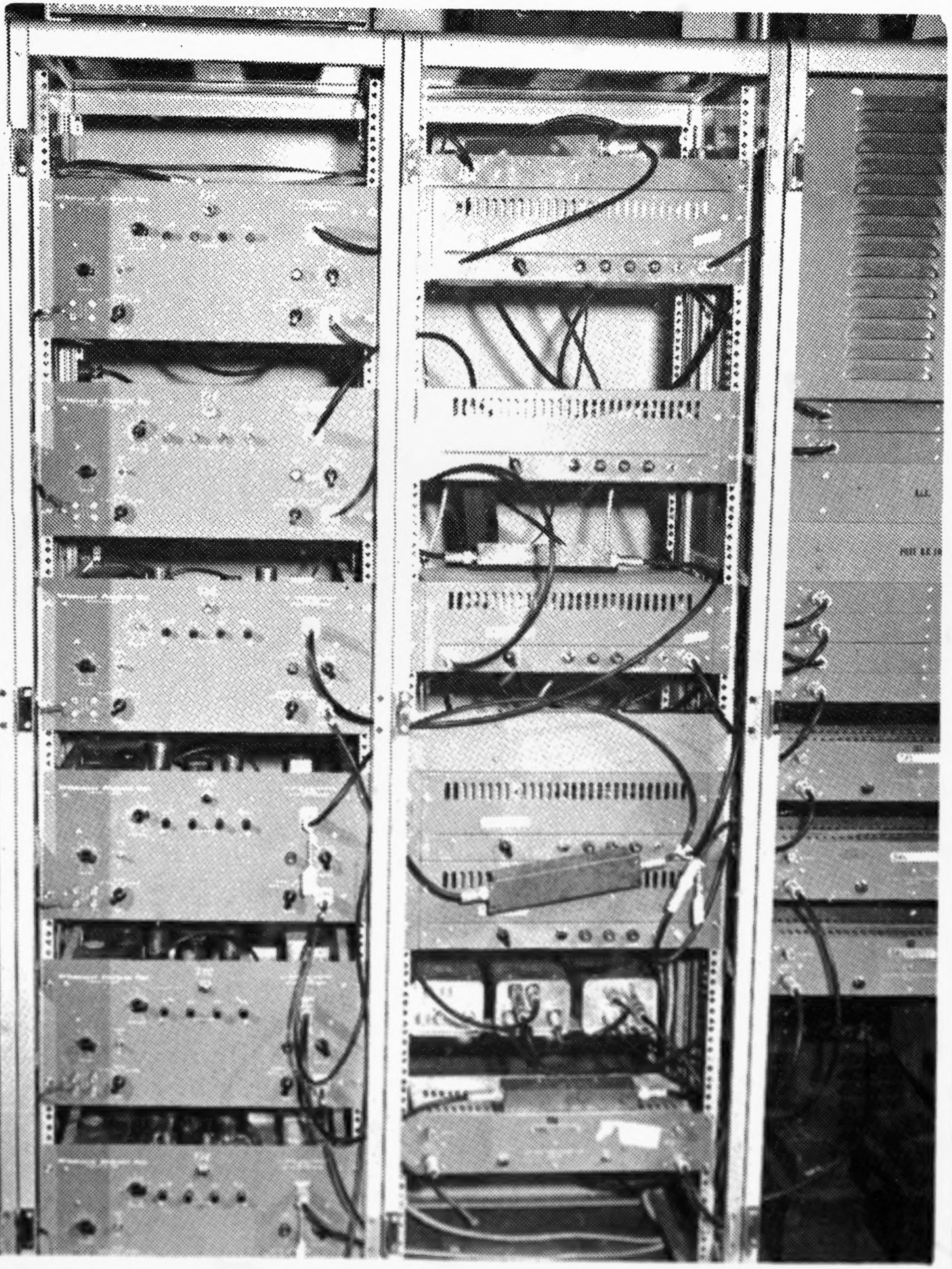
Early in the project it became evident that the important issue was not *whether* television should be used for direct instruction but *how* it should be used and *what* it could contribute to the improvement of instruction.

As a result, the curriculum is being continually revised and extended, teaching procedure studied, and achievement evaluated. Instructional television is regarded not as a "substitute", but as a valuable addition to the school program.

While much has been accomplished and substantial progress made in using television in the schools of Washington County, there is need for further study, analysis, and evaluation.

Television has been accepted as an important educational resource. Instructional television is a regular part of the school program and is now being used on an even broader scale than during the project. School staffs feel that instruction has been strengthened, pupil educational opportunity broadened, and achievement improved. All this has been accomplished by regular school personnel with a minimum of outside technical assistance. Savings resulting from the redeployment of personnel, equipment, and facilities, rather than additional funds, are being used to meet the costs. We in Washington County are, therefore, convinced that television has a definite place in the program, and, if properly used, can add a new dimension to education.

William M. Brish
Superintendent of Schools



TELEVISION IN WASHINGTON COUNTY

PART I

INTRODUCTION

Washington County, Maryland, in 1956, set out to establish in its public schools the nation's first large-scale closed-circuit television network. The purpose of the project was simple: to explore and evaluate the potential of television for instruction.

It was clear from the beginning that if television were to have any real future in education, two conditions would have to be met. First, it must bring about improvement in the educational program. Second, the cost must be reasonable. The county's experience since 1956 clearly demonstrates that television can fulfill both conditions and provide school systems with an educational tool of great value.

For instruction, for teacher training, and for improving and expanding the curriculum, the county has found television especially effective. In fifth grade arithmetic classes where television and classroom instruction were combined, pupils made almost two years' progress in nine months. Improvement in other subjects suggests that television can have considerable value in the classroom.

Science instruction offers an example of the way television can be used to upgrade the curriculum. Before television came into use, the county's elementary schools offered a minimum of science instruction. Elementary science was largely confined to what the individual teacher felt qualified to teach, and often this covered a fairly limited area—plants and animals, and perhaps a little astronomy and meteorology. The high schools offered one-year courses in physics, biology and chemistry. Now, television makes it possible to offer a sequential science program which starts in the first grade and continues through high school. Elementary and junior high school pupils are introduced to all phases of basic science through a related series of courses that expand steadily in complexity and scope. These changes in the lower grades will enable high schools to offer two years of biology, two of physics, and two of chemistry.

The services of school specialists such as guidance counselors can be greatly expanded. Working with school counselors and interested teachers, the guidance department supervisor has developed regularly-scheduled telecasts for voluntary listening by appropriate student groups. Using regular staff personnel or special guests, these guidance information programs provide helpful answers to the personal problems of pupils; offer assistance in the selection of subjects to be studied; aid in the selection of a college, a job, or a branch of the armed services; and provide orientation for pupils entering either junior or senior high schools. Because of the group guidance programs, more time is made available for individual counseling.

These and other curriculum improvements have been greatly accelerated by the use of television. Elementary pupils now have special television instruction in art, music, basic reading skills and French; junior high school pupils can take modern mathematics and foreign languages; high school pupils are offered an advanced mathematics course which covers calculus and analytic geometry. Many other examples could be cited. They all show that television has played a highly significant role in the development of the curriculum.

Some previous studies have stressed television's capability to relieve teacher and classroom shortages. The county has not found these to be the most important advantages offered by television, but there is no doubt that it can be helpful in both areas. In several county schools pupils would be attending classes in shifts today if it were not for space economies made possible by television. In areas where severe teacher shortage exists, television may prove helpful. Because of increased enrollments the county employs more teachers now than when it began using television, and school officials do not foresee a day when television will reverse this trend.

There was a time when it was thought that the cost of a county closed-circuit network would make its use prohibitive. But this has not been the case. The redeployment of personnel and equipment made possible by television has produced savings which cover the annual operating costs. And in terms of duplicating in conventional classrooms what is now offered on television, the county's savings are substantial. Without television, the county would require more than one hundred additional teachers and a budget increase of almost $1,000,000 to duplicate the courses that have been added to the instructional program. This is more than three times the annual operating cost of the television network. For example, without television it would cost more than $250,000 annually to provide art and music specialists for the elementary schools.

Current per pupil expenditures in the county, including the cost of television instruction, compare favorably with those in the rest of the United States. In the 1961-'62 school year, expenditures in the county were $368 per pupil. In 1960-'61 (the most recent figures available) twenty-eight states had higher per pupil costs. The range was from $207.32 in Mississippi to $683.28 in New York.

Many of the topics mentioned above will be discussed in greater detail in other sections of this report. However, some of the conclusions that county school officials have reached about television since 1956 are:

1. Pupil achievement can improve significantly when television is consistently used as a teaching aid.

   Improvement can occur regardless of grade, subject, range of ability or class size. Where television is used in a course year after year, higher achievement is generally maintained and improved upon in succeeding years, long after any novelty effect would have worn off.

2. Television accelerates the teacher's professional growth.

   It provides an invaluable way for teachers to learn by observing the teaching of others. The classroom teacher is encouraged to study and comment on the studio teacher's lesson, and this leads to greater awareness of teaching methods. Ultimately, it leads to a general improvement in methods of instruction, for the studio teacher, relieved of classroom responsibilities, has time to plan and develop better lessons.

3. Television makes it possible to upgrade the curriculum and enrich the educational program more easily and economically than before.

   It provides an effective way to introduce new courses and to bring special services to the classrooms — talks by scientists, poets, government leaders. It also focuses the attention of many teachers on courses and their content, thus easing the problem of curriculum improvement.

4. Television is especially useful as an instructional aid to add new learning experiences to the school program. It does not "replace" the teacher or "substitute" tech-

niques and procedures which would eliminate regular classroom learning activities and personal teacher-pupil relationships.

The television lesson provides many opportunities for involving pupils in the learning process and for helping them accept responsibilities and develop important skills of self-teaching. The instructional value of television is directly related to the way it is used.

5. The operational costs of television can be met without increasing the normal school budget.

The television system can effect sufficient savings to pay for itself. These savings result from re-deployment of teaching equipment, changed organization within schools, and altered scheduling of personnel. It may also be possible to develop enough savings through television to increase teachers' salaries.

6. The problem of finding and retaining top quality teachers is eased.

Teachers make their skills more widely available through television. The challenge of teaching on television gives many good teachers an added reason for remaining in the profession. Since the use of television makes possible the scheduling of pupils in large, medium-sized and small groups during the school day, increased enrollments do not require the number of additional teachers formerly needed. School systems can therefore be more selective in their recruitment and can encourage teachers by making more time available during the school day for them to plan, study, keep abreast of new developments and work with individual pupils.

7. Television changes the role of the classroom teacher and makes him — along with the studio teacher — part of a teaching team.

Where he can use television as an aid, the classroom teacher has the opportunity to concentrate on planning related classroom activities. It also gives him far more time to provide special help for pupils who need it. His guidance role takes on new importance.

8. Television brings greater equality of opportunity for all pupils.

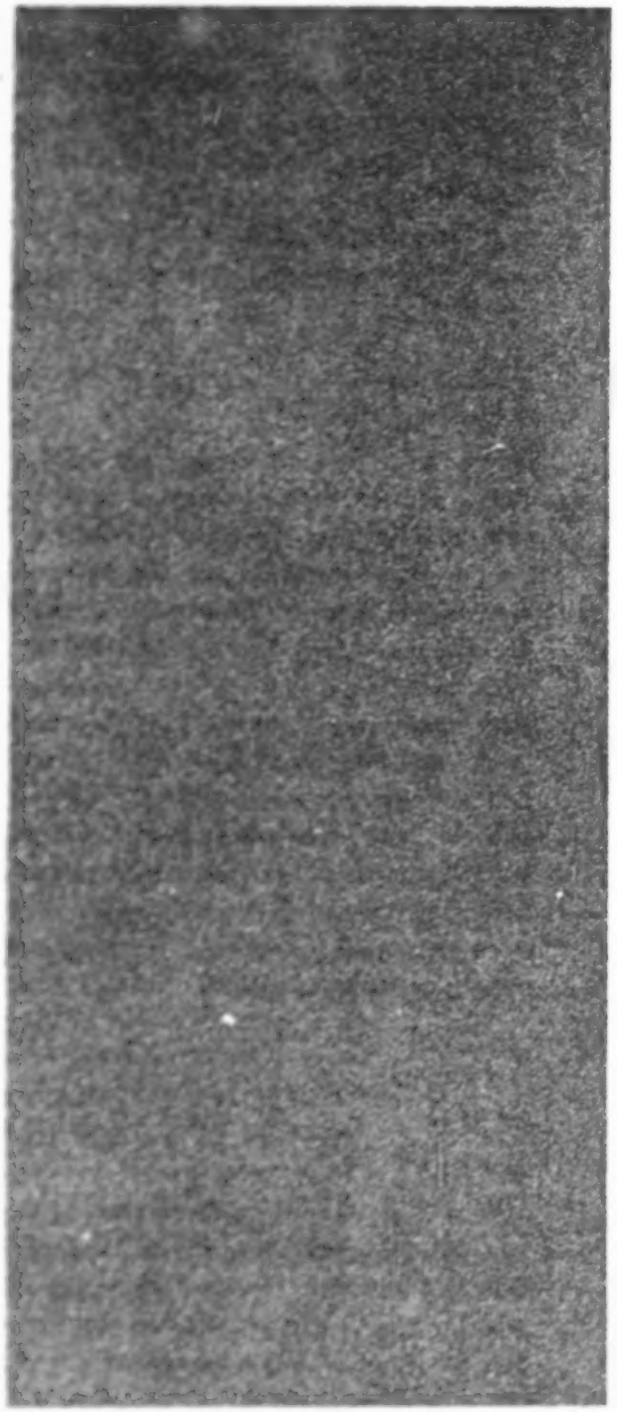
In an underprivileged area or the most cultured district, children participate in the same lessons and special events through television. Pupils in the small rural school have the same studio teachers and the same variety in courses as do children in larger schools. The small high school can offer courses which, without television, would be available only in the large high school.

9. Television increases vocational training opportunities.

Lessons with direct vocational application can be presented on television — in many cases with greater ease and effectiveness than in the classroom. In addition, in Washington County, Hagerstown Junior College students have had valuable experience working in the television studios. They supply most of the manpower needed to operate the school television network, and in the process they acquire knowledge of the techniques of production and transmission, as well as of maintenance, operation and repair of equipment. For some, this work experience has been a steppingstone to a career.

10. School television facilities can serve the public in a variety of ways—for adult education, community projects and the dissemination of many kinds of information.

Schools may be used as centers where interested adults may participate in special televised courses or receive information on topics of public interest. Community projects can be promoted in the regular schedule of televised lessons.



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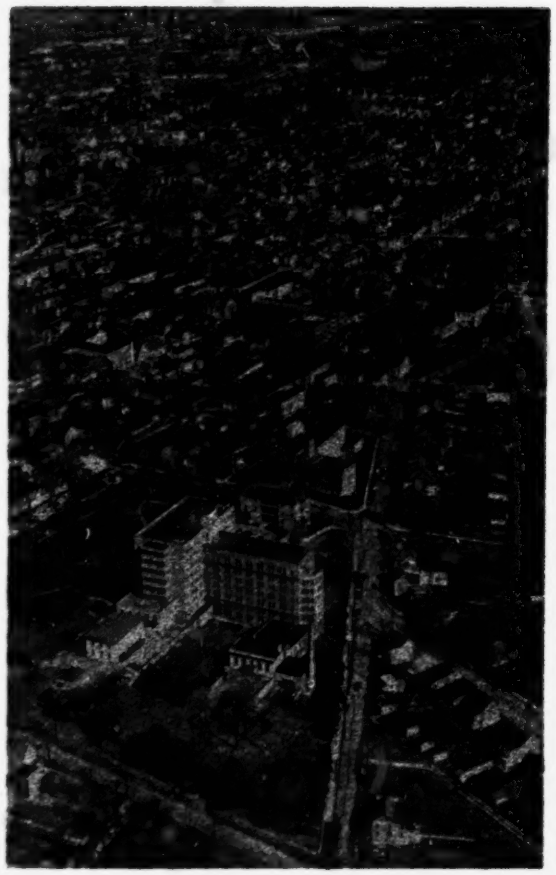

Washington County, Maryland, is neither rich nor poor. It is a typical American community with a diverse agricultural and industrial economy, a multitude of colorful old brick homes, and a celebrated Civil War battlefield—Antietam.

EYERLY'S
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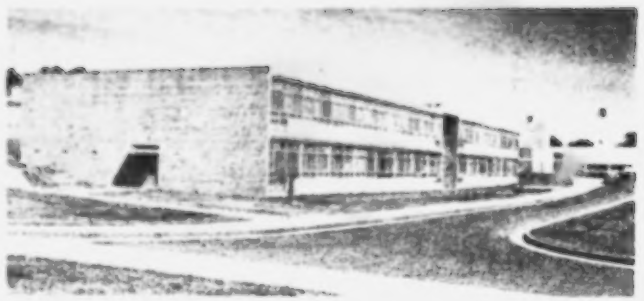
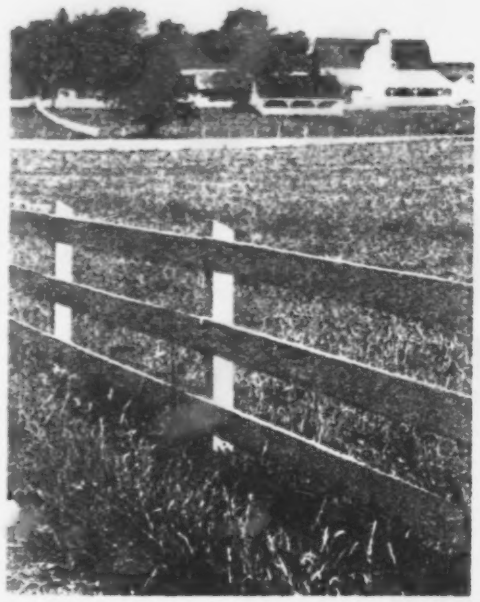
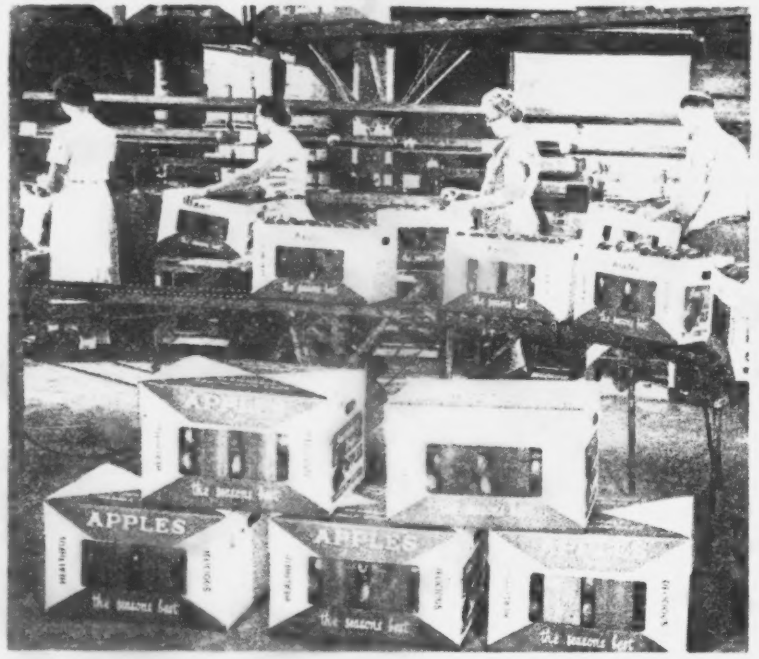
LIQUORS






APPLES
APPLES

The county contains 468 square miles and 91,000 people. Most of the population (61,000) is in the urban Hagerstown area. The remainder is scattered in surrounding towns, villages and rural sections. The county's factories turn out aircraft, sandblast equipment, trucks, textiles, furniture and pipe organs; the farms produce grain, fruits, berries, dairy products and livestock. As in most other parts of the United States, the population has been growing steadily. In 1960 it was up 13% over 1950, and 24% over 1940.

The public school system serving the county operates forty-five schools and a junior college. School enrollment is now more than 20,000, or more than 45% above the enrollment of 1950. Twenty schools have been built since 1949, but even so, construction has barely kept pace with the increase in enrollments. The county's school problems, then, have been very much like those of other communities throughout the country.

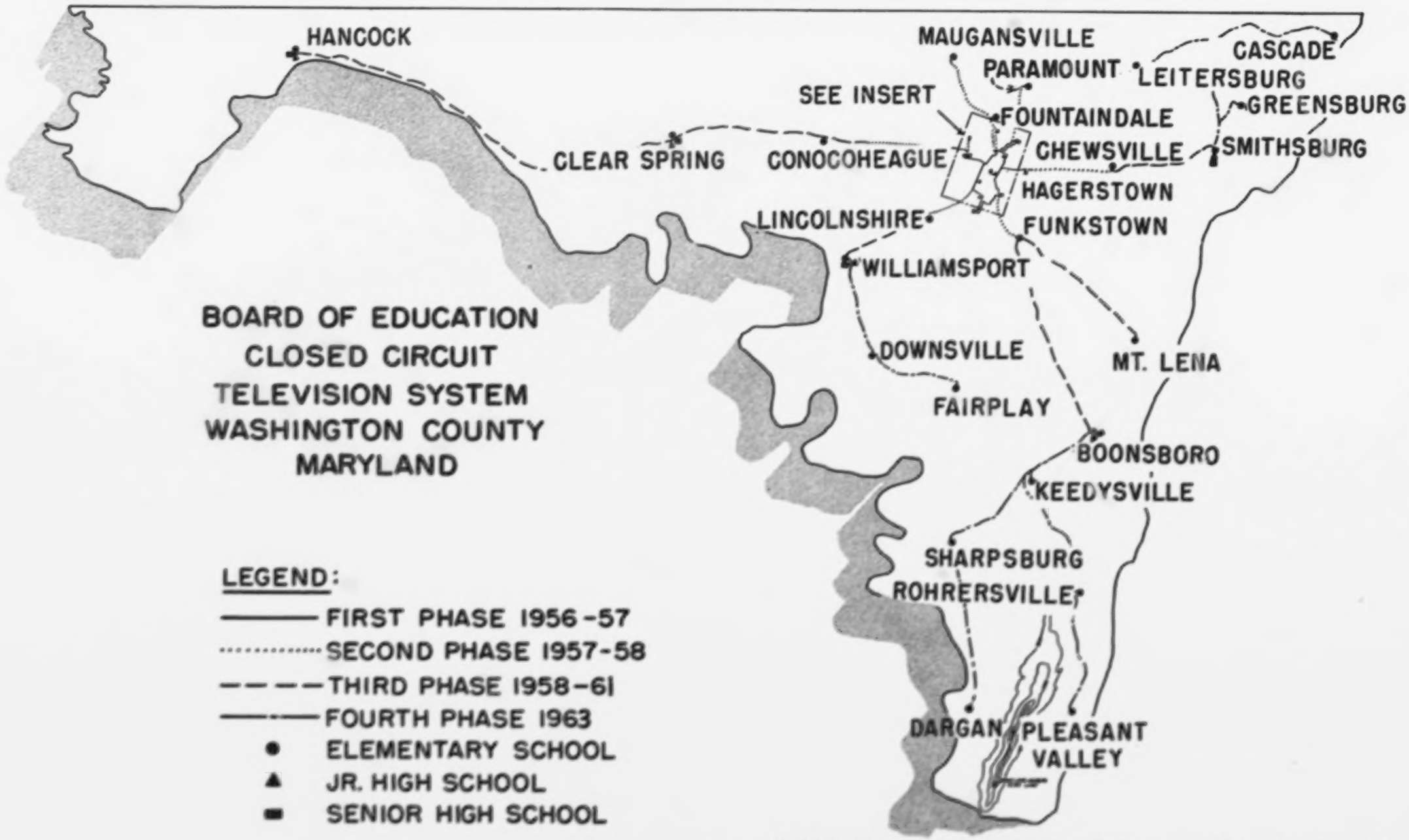
The Board of Education first considered using television in the schools in 1954. The Board was then aware that the children of the 1950's came to school with a better background of information than earlier generations—and that a primary reason for this was exposure to new experiences via television in the home. This situation suggested a need for curriculum changes to avoid trying to teach children things they already knew. It also suggested that television might be even more valuable in the classroom than in the living room.

The Board was unaware of it then, but a movement was underway to set up a project which could explore the uses of television for instruction. Backing this project was a joint committee formed by the Electronic Industries Association and the Ford Foundation's Fund for the Advancement of Education, with a number of consultants representing various educational agencies. The committee wanted to start a large-scale project—something that would provide a comprehensive test of television. The emphasis was to be on regular, direct instruction by television rather than on occasional or supplemental uses of it.

Washington County was ultimately chosen as the site of this project on the basis of a proposal to use television for instruction at all grade levels and in basic subject areas; to use it for teacher education and for improvement and enrichment of the curriculum. The county also proposed to test television's usefulness in relieving classroom and teacher shortages and in achieving better use of community and school resources. And finally, it proposed to find out whether instruction by television was economical.

This study, the Washington County Closed-Circuit Educational Television Project, was an exploratory and practical experience—not a formal research experi-

BOARD OF EDUCATION
CLOSED CIRCUIT
TELEVISION SYSTEM
WASHINGTON COUNTY
MARYLAND



WASHINGTON COUNTY

LEGEND:

- ——— FIRST PHASE 1956-57
- ..... SECOND PHASE 1957-58
- – – – THIRD PHASE 1958-61
- ——·—— FOURTH PHASE 1963
- ● ELEMENTARY SCHOOL
- ▲ JR. HIGH SCHOOL
- ▬ SENIOR HIGH SCHOOL

ment. It extended over a period of five years, 1956-1961, and included the schools of an entire county school system. The project program developed as a natural outgrowth of the curriculum improvement program which had been evolving over a period of many years. Television lessons were scheduled regularly to make them integral parts of courses, but at no grade level did they occupy a major portion of a school day. The telecasts did not prevent pupils from having personal contacts with teachers and from engaging in the give and take of classroom discussions. The television experience was planned as only part of a total learning experience for the pupil.

The project got underway in the summer of 1956. One hundred teachers, principals, supervisors and community leaders gathered at a workshop in July and August to plan the new television instruction program. At the same time a team of Chesapeake and Potomac Telephone Company engineers under William C. Warman began stringing cable for the television network; and John R. Brugger left his post as chief radio and television engineer at the University of Illinois to design and install the transmission center. The installation was completed that fall in time for telecasting to eight schools. The system was expanded until by September, 1963, every public school in the county was linked to the television circuit.

As the project developed, television came steadily into use at all grade levels and in most subject areas. Television instruction was coordinated by staff members T. Wilson Cahall and Robert F. Lesher. Each summer and at times during the school year, teachers, principals, parents, supervisors and administrators gathered to assess progress and to restudy courses and teaching methods. New courses were added, old ones altered —until today more than fifty courses are included in the television program. By the time the project's official life came to an end in 1961, the county not only had a new teaching aid in the classroom, but also was well on the way toward having a vastly improved curriculum and a new approach to teaching—by teams. The advantages of television were apparent and the cost low enough so that after outside financing had ended, the county was able to continue and even expand its use of television in the classroom.

Throughout the five years of the project, the county school system received

support from two major sponsors—the Electronic Industries Association and the Fund for the Advancement of Education. Invaluable assistance also came from the Chesapeake and Potomac Telephone Company of Maryland.

The Electronic Industries Association, representing major electronics companies, provided free of charge the necessary television cameras; receivers; and studio, control room, projection and recording equipment. Seventy-five manufacturers donated the equipment valued at $300,000.

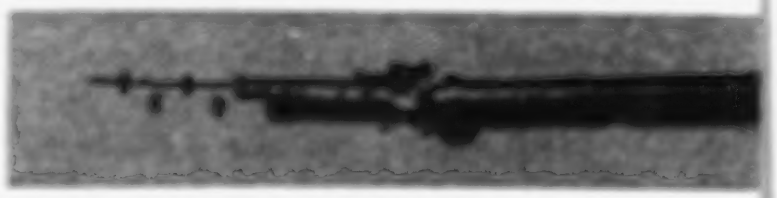
The Fund for the Advancement of Education and the Ford Foundation underwrote other project expenses. These included the costs of designing the system, administering and supervising the project, providing secretarial help, paying cable rental fees, securing additional television sets, solving various production problems, training technical personnel, and carrying out the evaluation program. The Fund and the Foundation together contributed about $200,000 a year to the project over the five-year period.

The Chesapeake and Potomac Telephone Company, with technical advice from Bell Laboratories, developed the closed-circuit system for transmitting television to the classroom. This system included more than 115 miles of coaxial cable plus transmitting and amplifying equipment.

In the completed system in Washington County, forty-five schools are linked by coaxial cable to form a closed-circuit television network. Six lessons can be sent simultaneously over this cable and picked up on more than 800 standard twenty-one-inch television sets in classrooms, school cafeterias and auditoriums throughout the county. Many classrooms are equipped with two sets, so that no pupil has to sit far from the screen. Auditoriums and other large viewing rooms are equipped with several sets, generally one for every twenty-five children. Large screens are now being used to replace small receiving sets in auditoriums and other large viewing areas.

THE SYSTEM AND THE STAFF

To many educators, the most unfamiliar and perhaps worrisome aspect of classroom television is the system itself. It is a complex electronic affair, with strange devices and odd terms like "videcon," "zoom" and "dolly out." Yet the actual task of operating such a system is not as forbidding as it might sound. Washington County has found that it can operate an extensive closed-circuit system with a minimum of professional and technical assistance. Many other school systems are probably in a position to do the same.



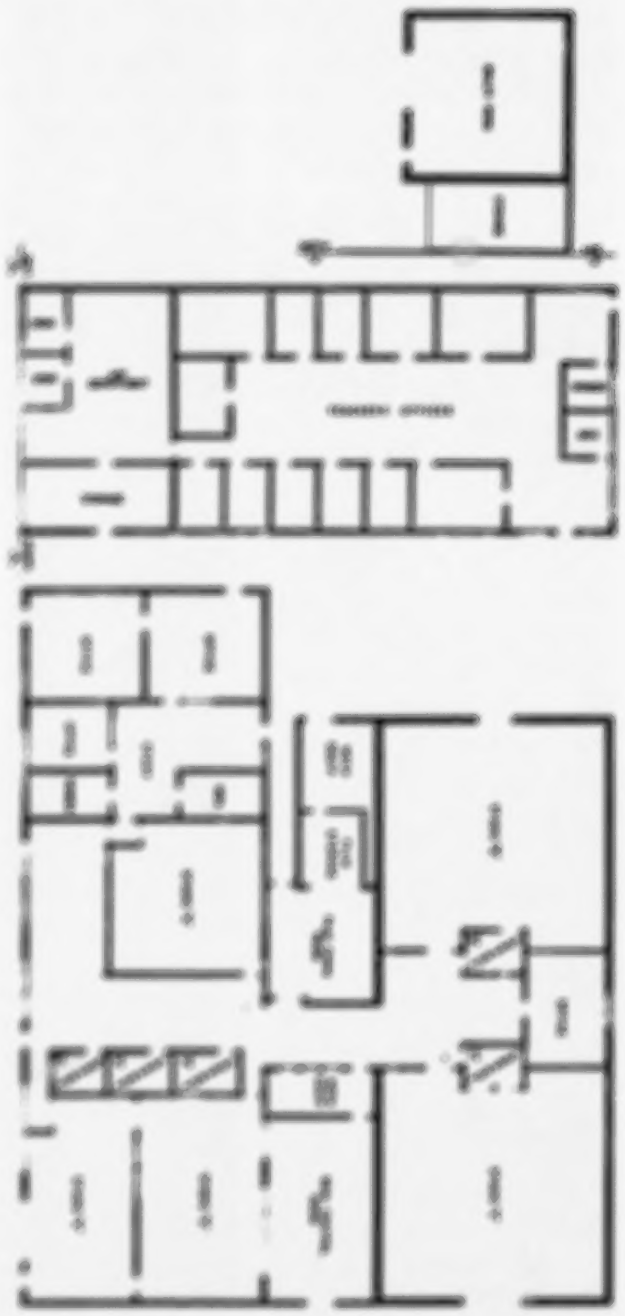
The lessons are transmitted from a Television Center adjacent to the Board of Education offices in Hagerstown. This center is a pre-fabricated metal building with a concrete block addition covering an area of 100 by 125 feet. A few years ago it had a dirt floor and housed farm equipment. Now it contains five television studios. Three of these are twenty-five by thirty feet, and two are forty feet square—large enough to permit the use of an automobile or truck for demonstrations. From these studios more than twenty-five lessons a day or 125 a week are transmitted to schools. These lessons are for the most part live telecasts. The Columbia Broadcasting System, operating day and night seven days a week, produces about 140 live programs, while National Broadcasting Corporation in the same period transmits about sixty.

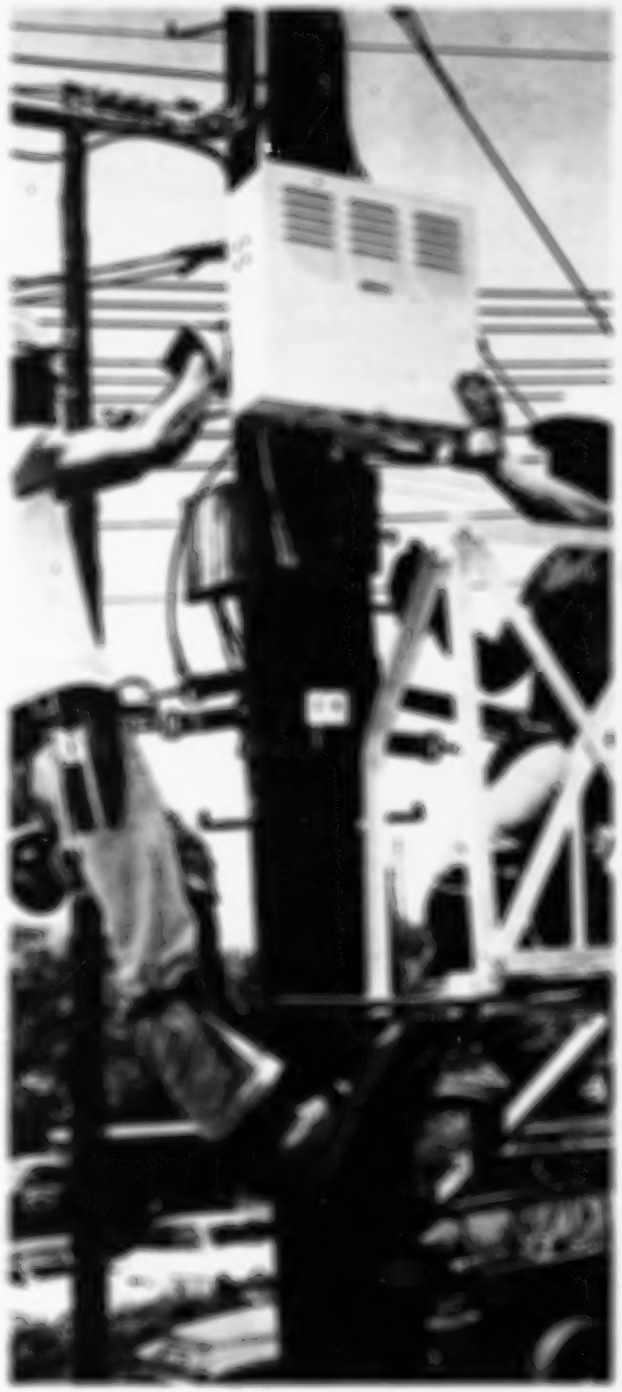
The center also contains offices for production, engineering, supervisory and clerical personnel, and a film projection room. Slides and films are stored, repaired and previewed in the film room from which they can be fed either into any of the five studios or directly to the schools over the closed-circuit system. Adjacent to the Television Center is another pre-fabricated metal building 100 by 40 feet which contains office space for the studio teachers, plus a work room for the art staff.

Before installing a television system for classroom instruction, it is first necessary to decide whether it shall be a closed- or open-circuit system. The open-circuit system requires no cable, thus eliminating cable rental costs. But this system provides a single transmission channel, so that only one lesson can be telecast at a time. The closed-circuit system permits transmitting six or more lessons at a time; and since Washington County wanted to make extensive use of television for teaching, it chose the closed-circuit system.

At the time the Board of Education asked the Chesapeake and Potomac Telephone Company to install this system, in June of 1956, there was considerable question as to whether it could be done economically. One engineer, for example, made a guess that cable rental costs for such a system would amount to $2,500,000 a year and capital costs to $7,000,000 or $9,000,000. His estimate made sense in terms of costs then being experienced by the major networks; and there was no other experience on which to base an estimate. No one had yet built an economical closed-circuit system of the size and quality needed in Washington County.

But whereas the major networks trans-





mit over a system combining expensive underground cable and microwave relays, the telephone company ultimately worked out for Washington County a system using a simplified coaxial cable. The cable rental cost is about $150,000 a year, or one-seventeenth of the $2,500,000 estimate. This made all the difference between a practical and an impractical system. The completed network, in fact, represented an electronic engineering milestone, and systems built since have been modeled upon it. The telephone company used its Washington County experience to formulate the rate schedule that is now being used nationwide for its closed-circuit service.

The television network first reached 4,000 pupils in 1956, then 12,000 in 1957, 16,500 in 1958, 18,000 in 1961, and 20,500 in 1963. The quality of the system has been improved steadily, and while it is not without flaw, it is highly reliable and generally excellent. The chief engineer estimates the system's reliability at better than 99%, which means that breakdowns are extremely rare.

Operating this system requires a substantial staff. A precise figure is hard to give because there is no definite line between television personnel and non-television personnel. In all, there are about seventy people working most of the time in the television system—and this includes teachers, supervisors, technical and clerical personnel, as follows:

Coordinator	1
Instructional Supervisor	1
Teaching Staff	23 (About ten part-time)
Production Staff	30 (Seventeen part-time)
Engineering Staff	8 (Four part-time)
Art Staff	3
Clerical Staff	4

A brief discussion of the duties of the coordinator and of the supervisory, production, engineering and art staffs follows. While these departments are discussed separately, in practice they work together very closely. The standard studio crew for telecasting a lesson includes the teacher, two technicians, a director, a floor manager and two cameramen. All are interdependent.

COORDINATOR

The coordinator works directly under the assistant superintendent in charge of instruction as chief-of-staff for television. His duties include coordination of the work of the departments of engineering, production and instruction.

INSTRUCTIONAL SUPERVISORY STAFF

A supervisor of television instruction works as a member of the county staff of general instructional supervisors. His responsibilities to the studio faculty are similar to those of a principal in a conventional school. The entire group of instructional supervisors, however, provide assistance to studio teachers in the planning, teaching and evaluating of televised courses.

In addition to their other relationships with studio teachers, instructional supervisors arrange for them to meet with classroom teachers to discuss problems of mutual concern as members of a teaching team.

PRODUCTION STAFF

It is the teacher's responsibility to present the lesson and the engineer's job to transmit it, while it is the production staff's job to see that the lesson is presented as effectively as possible. The task of the production staff is not easily defined. The teacher is, essentially, the equivalent of the commercial station's producer. He decides what his lesson is to include, and no techniques of production are allowed to violate the teacher's conception of the method and principles of teaching involved. The director is there to help the teacher work effectively—to help him use television's many capabilities. Production techniques are designed to implement the teacher's conception of the lesson.

The teacher new to television has much to learn about teaching in a studio situation. He must modify his habits of walking and talking. He must learn the skills of interviewing, working with a studio crew, using studio cues and signals and teaching with a variety of visual aids. This does not imply that the television teacher must become a professional actor. It means mastering simple techniques such as walking slowly enough for the camera to follow smoothly, and gesturing in such a way that the camera does not distort the arm or hand. The teacher must also learn how to prepare a script outline. The script is necessary not only as a guide for the teacher but also as a cue to let the director know what the teacher plans to do, and when. If the teacher intends to walk from one part of the studio to another, the director must know when, so that he can have the cameras in readiness. If films, slides or other kinds of visual aids are to be used, the script must indicate to the director when and where in the sequence of the lesson they are to come.

At the Television Center, two experienced supervisors head the production staff. They also teach communications courses for the Hagerstown Junior College. Most of their staff of thirty is made up of junior college students, almost half of whom are majoring in communications. In addition to the two supervisors, there are five full-time and three part-time directors. The rest of the staff is made up of cameramen and four managers who assist the director. The fact that many of the students are studying communications at the junior college is a great advantage in training them for work at the Television Center.

About half of the production crewmen are new at the beginning of each school year. Many of them arrive at the Television Center less than two weeks before school opens, knowing only how to operate the family television set. In twelve days they are operating cameras with considerable skill. Ninety per cent of the television lessons are live. The rest are taped on occasions when the teacher must be absent at the usual lesson time, wishes to interview a resource person at his convenience or desires to evaluate his telecast as it is received in a classroom situation.

ENGINEERING STAFF

The Chesapeake and Potomac Telephone Company carries all responsibility for the maintenance and operation of the cable and the system amplifying equipment. All other equipment—television cameras, receivers, projection, recording, studio and control room equipment—is the responsibility of the chief engineer and his assistants. They maintain equipment and supervise the transmission of the audio and video signals.

The engineer and his assistant supervise the staff of technicians who have varied responsibilities.

The Engineering Department, like the Production Department, trains its own personnel. With the exception of the chief engineer and his assistant, all are junior college students or recent high school graduates. Not infrequently these students go on to careers in electronics.

1. The film room operator
   - maintains a library of films which he catalogues, cleans, splices, and inspects
   - feeds the proper film into the studio, or directly to the schools
   - schedules film previews for teachers
   - helps teachers select parts of a film for use in their lessons

2. The video-tape recorder technician
   - records lessons or special demonstrations
   - maintains a library of approximately 300 one-hour tapes of previously recorded materials
   - operates the video-tape recorder
   - schedules the replaying of tapes

3. The audio-video operators
   - connect the studio to the proper channel
   - control the equipment which determines the quality of the audio and video signal
   - operate turn tables and recorders

4. The maintenance crewmen
   - service the 300 television sets located in 45 schools
   - test the 15,000 tubes in the television system
   - install and maintain equipment at the Television Centre

ART STAFF

The Art Department provides a number of important services. There are three full-time staff members in this department, all recent high school graduates talented in art. They prepare most of the maps, charts, diagrams, artistic overlays, special illustrations, models, backgrounds for sets and similar material used by the teachers in more than fifty televised courses. While much commercially-produced illustrative material is available, often it is not suitable for television. Many maps are too detailed, and illustrations are not proportioned for the television screen, which requires a height-width ratio of three to four. Worthwhile illustrative material can often be produced much more cheaply than it can be purchased. Having the Art Department makes it possible for teachers to be much more flexible in planning graphic materials for their lessons—a vital advantage if the most effective use is to be made of television.

TELEVISION IN THE SCHOOLS

The "correct" way to fit television into the conventional school routine will probably be debated for years to come. The proper length of the television lesson, the optimum size for the television class—opinions about these and other problems may ultimately fill volumes. No one now has had enough experience to know the best conclusions.

Nevertheless, a few things do seem clear. One is that television should not take up a major portion of any pupil's school day; television is best used as a specialized kind of learning experience or as an aid to classroom instruction. The other is that a television lesson should generally be followed as soon as possible by a session with the classroom teacher.

But there is now no easy answer to the question of how long a television lesson should be. The fact that the attention span of a first grader is shorter than that of a high school pupil has bearing on the question. So does the fact that pupils at the same grade level can profit by a longer television lesson in a subject like art, than in others, such as conversational French, where more concentration is required.

At present elementary pupils spend 7.3% to 13% of their classroom time watching television lessons. These lessons, ranging in length from thirteen to twenty-five minutes, are followed by work in the subject with the classroom teacher. Junior high school pupils spend almost one-third of their time in television classes, while high school pupils seldom spend more than 10% of their time in television classes. (See Table A).

None of these time periods are recommended as the ideal. The staff is inclined to believe that the amount of television viewing time in the elementary schools is satisfactory. Junior high schools may have too much viewing time, while high school pupils might profitably spend more time than they now do.

The flexibility of the elementary school day makes it much easier to use television there than in the junior or senior high school. Since there are no rigidly defined periods in the elementary school, the classroom teacher can devote as much or as little time as he deems necessary to preparation for the television lesson, or to discussion and other follow-up work. The junior and senior high school schedules, on the other hand, are relatively inflexible. When the day is made up of six periods of equal length, both television and classroom teachers are more limited in what they can do.

TABLE A

WEEKLY TELEVISED INSTRUCTION TIME

COURSES IN GENERAL USE IN SEPTEMBER, 1961

GRADES	1 and 2	3	4	5	6	7 and 8	9 and 10	11	12
SUBJECTS									
MUSIC	40† (2)*	40 (2)	40 (2)	50 (2)	50 (2)				
ART	20† (1)*	20 (1)	20 (1)	20 (1)	25 (1)				
MATH	40† (2)*	40 (2)	40 (2)	50 (2)	50 (2)	106 (2)			
SCIENCE	20† (1)*	20 (1)	25 (1)	50 (2)	50 (2)	159 (3)	159 (3)		
FRENCH		52 (4)	52 (4)	40 (4)	40 (4)				
CORE AND SPANISH						265 (5)			
U. S. HISTORY								159 (3)	
ENGLISH									159 (3)
TOTAL MINUTES	120† (6)*	172 (10)	177 (10)	210 (11)	215 (11)	530 (10)	159 (3)	159 (3)	159 (3)
PER CENT OF TIME WEEKLY	7.3%	10.4%	10.7%	12.7%	13%	10 pds. 33⅓%	3 pds. 10%	3 pds. 10%	3 pds. 10%
	OPTIONAL COURSES								
READING	60† (3)*	90 (5)	70 (4)	70 (4)	70 (4)				
MATH FOR MATHEMATICIANS									150 (3)
PHYSICS FILMS								90 (3)	
GRAND TOTAL IN MINUTES	180† (9)*	262 (15)	247 (14)	280 (15)	285 (15)	530 (10)	159 (3)	249 (6)	309 (6)
TOTAL PER CENT POSSIBLE WEEKLY	10.9%	15.9%	15%	17%	17%	10 pds. 33⅓%	3 pds. 10%	4.5 pds. 15%	6 pds. 20%

† MINUTES PER WEEK. * NUMBER OF CLASS PERIODS PER WEEK.

The question of class size becomes highly important when a school system begins to use television for instruction. Theory has long put optimum class size at twenty-five or thirty. Experience in using instructional television may well prove the value of this optimum size to be mythical—at least for certain kinds of instruction. Theoretically, the size of a television class is limited only by the size of the auditorium available, and in practice, pupils in large television classes learn as well as do pupils in small classes. This has obvious advantages for any school system. But if televised instruction is most successful when followed immediately by classroom work, the question arises, can this be accomplished with a large group?

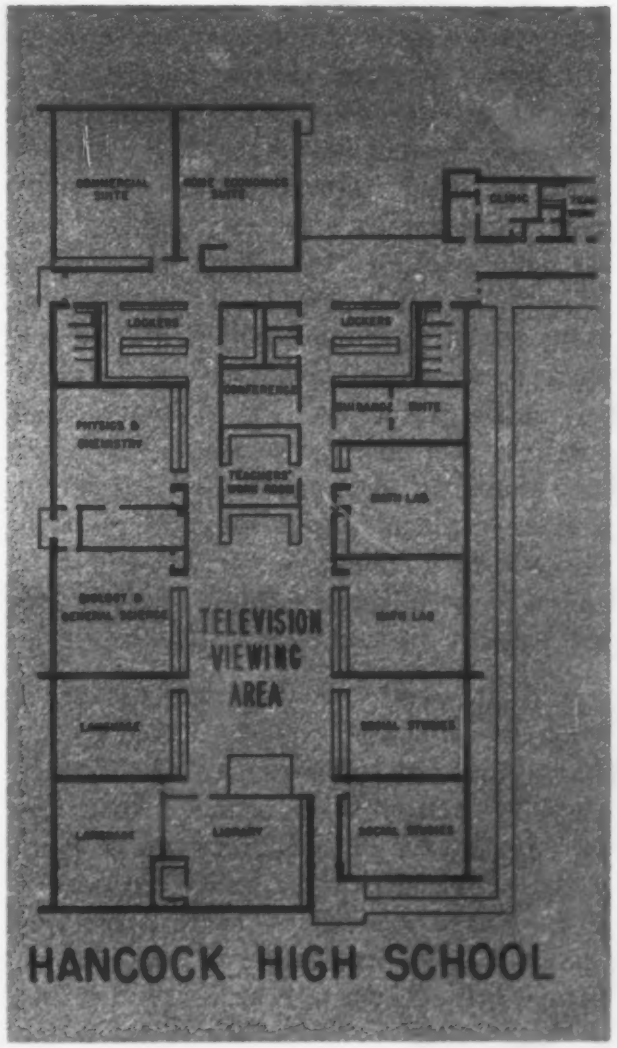
In most Washington County elementary schools class size has not been changed because of the use of television. But in a few elementary schools, large-group instruction has been tried recently, and it has worked out well. In one such school, grade-size classes (comprising all pupils in a grade—in this case about seventy) have been taught. The pupils first view the television lesson, and afterward do appropriate classroom work—still in the same large group. Teachers were at first doubtful that such large groups could be handled effectively, but a trial proved that they could be; and in this school, teachers now have one to three hours of unscheduled time each week. They use it to keep records, to plan lessons and to visit pupils' homes. The principal of the school has found that handling such large groups requires more planning and managerial ability on the part of the teacher, but no extraordinary teaching skill. This principal believes that his school could handle one-third more pupils with an expanded large-group instruction system.

In the junior and senior high schools, groups of 100, 200 or 300 pupils often view television lessons in auditoriums, cafeterias and other large viewing areas. As in the elementary school, handling such groups requires managerial ability, but this has presented no major problems. And large groups have provided some advantages. If 400 pupils are scheduled in an auditorium for a television lesson, twelve classrooms are freed for use by other pupils. In several instances, the use of such a plan has made it possible for crowded schools to avoid double sessions.

Large groups also make it possible to use both teachers and classrooms more

efficiently. For example, a junior high school teacher formerly taught five sections of thirty pupils—150 pupils—every school day. This same teacher might now have during the first period of each school day, 120 pupils (or four sections of thirty) in an auditorium for a large-group television lesson. During the remainder of the day he might meet each of these four sections, one by one, for classroom work. Thus, at the end of the school day, the teacher has, in effect, taught eight sections, whereas before he taught five; and yet his work load is lighter, because he grades and keeps records on only 120 pupils instead of 150. Television thus makes this teacher the equivalent of one and three-fifths "pre-television" teachers. While large group scheduling may save teacher time, it may result in an increase in the number of different pupils assigned to an individual teacher for instruction.

Class size becomes a topic of debate primarily when the issue of classroom instruction as opposed to television instruction arises. There is little question that for certain types of learning experiences, such as discussion, groups of 200 or 300 are much too large. In a group of this size, usually only a few pupils will take part in discussion. Often, too, the very large group possesses an inconveniently wide range of ability. To solve these and related problems, large television classes have, as a general rule, been broken into smaller groups for classroom instruction. This is usually done on the basis of achievement. Often such classroom groups can be smaller than the traditional size, which tends to improve conditions for discussion and individual work with the teacher.



The mechanics of shifting from large groups to small and of making all schools conform to the county-wide television program create problems for principals. Schedules sometimes become complicated, particularly in school buildings which were not planned for television. When auditoriums are in frequent use for television lessons, it becomes more difficult to schedule assemblies. When large groups regularly use the cafeteria or the gymnasium for television lessons, the scheduling of lunch and athletic activities can become complex.

In the newer schools, planned with television in mind, these scheduling problems have been eased by providing more viewing areas for large groups. One of the most successful arrangements developed to date is at the Hancock School (see floor plan) where classrooms are clustered on four sides of a large viewing area. This viewing area has no windows opening to the outside, so there is no direct sunlight, and television reception conditions are at their best. This arrangement also makes for easy access to viewing area, and it offers a further advantage because the facility can be planned and built as a unit to enlarge schools when and where necessary.

A somewhat more subtle but equally important aspect of fitting television into the school system lies in making it a normal, integral part of the instructional program. Teachers and pupils alike must come to accept television—if it is to be used successfully — as a regular and valuable part of the school experience. They must not look upon it as entertainment to be watched without serious attention, while the primary business of learning is put aside. The film has often fallen victim to this usage in the past: the room is darkened, the projector whirrs, and the pupils subside in their chairs with a collective and audible sigh, ready to be entertained. Television will not achieve its purpose if this happens.

And it need not happen, providing teachers and school administrators see that it does not—particularly at the stage when television is introduced into the school program. Two factors can be especially helpful here. One is the precedence of teachers rather than production specialists in the television studio, which means that education is always put ahead of showmanship. The other factor is the teaching team. If both classroom and studio teachers accept television as valuable, and work to achieve its potential, their pupils will accept it, too, and gain from it.

THE CURRICULUM

One of the most valuable aspects of television is the unequalled opportunity it provides to examine and upgrade the curriculum. When a teacher presents a lesson on television, perhaps sixty other teachers are watching him in their classrooms. By the end of the school year, these teachers have had a common experience with each television course transmitted to their classrooms. This puts them in an excellent position to pool their experiences, ideas, and knowledge and help the studio teachers improve these courses in the coming year. Never in the past has such concentrated attention to course content been possible. But the process needn't actually wait until the end of each school year. In Washington County, teachers from studio and classroom meet often with supervisors to discuss the curriculum and, where necessary, to revise it.

There remains the question of what to teach on television, and Washington County has sought the answers to this question in three areas. The county uses television in courses where teachers welcome help, in subjects where television offers obvious and special visual or illustrative advantages, and for courses which could not otherwise be offered.

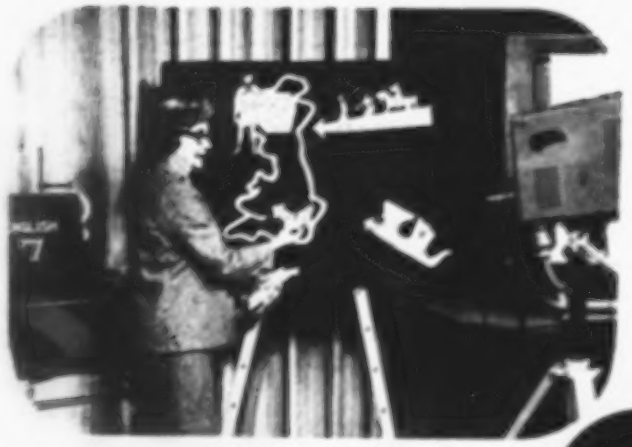
In any school system there are usually areas where teachers are glad to have assistance, and this is particularly true in the elementary schools. The elementary teacher must, in theory, be competent in many subjects; but in fact, most elementary teachers feel weak in at least one or two areas—it may be art, or science, or music, or something else. Beyond that, the average elementary teacher has a heavy teaching schedule, and almost invariably welcomes the assistance of the studio teacher.

The county could not possibly have afforded to hire special science, art or music teachers for each of its thirty-eight elementary schools. But it can afford to hire one or two teachers expert in each of these subjects to instruct all pupils via television. The benefits of this plan are two-fold. The teaching of science, art and music is improved, and the elementary teacher has more time for planning.

Among subjects where television offers certain obvious advantages is science. Television makes it possible for trained science teachers to reach the maximum number of pupils. Illustrative material is immensely helpful in teaching this subject, but often such material is too expensive to supply or too difficult to bring into the classroom. Using films, slides and other devices, the television teacher can provide his pupils with many more experiences than could the classroom teacher alone.

Finally, television makes it possible to add subjects to the curriculum which would not otherwise be offered. Advanced science or mathematics courses, remedial courses — in fact, any number of courses for which specially-trained teachers are needed — can be provided when television is available. This benefits not only those average or above-average students who are capable of taking advanced courses. It also helps below-average pupils, who frequently are able to learn more from the television screen than they can in a classroom where learning is more dependent on reading skill. Even more important, since the small high school is linked to the same television network as the largest high school, the pupils in each can be offered lessons equal in quality. The number of subjects offered in the small school need no longer be limited. In a time when a broad educational background appears to be of growing importance, this advantage offered by television seems especially significant.

Visitors to the county's schools sometimes ask whether there are subjects which should not be taught on television. No one yet has sufficient experience to be certain of the answers to this question.



In certain subjects, television is obviously very successful. In others, it is less so, although it appears that in no subject does television fail to produce results at least as good as those achieved when classroom instruction alone is used. There are many on the county staff now who believe that any well taught subject will be effective on television, and that failures are caused by unsatisfactory presentation, not by weaknesses inherent in television. It is certainly true that no one should judge hastily whether or not a course is suitable for television. Many teachers in Washington County who thought that arithmetic could not be taught successfully on television have changed their minds, because test results have made it quite clear that elementary pupils made much more rapid progress in arithmetic with television than they did without it.

The following tables show the increase in course offerings in the instructional television program from the 1956-57 to the 1960-61 school year.

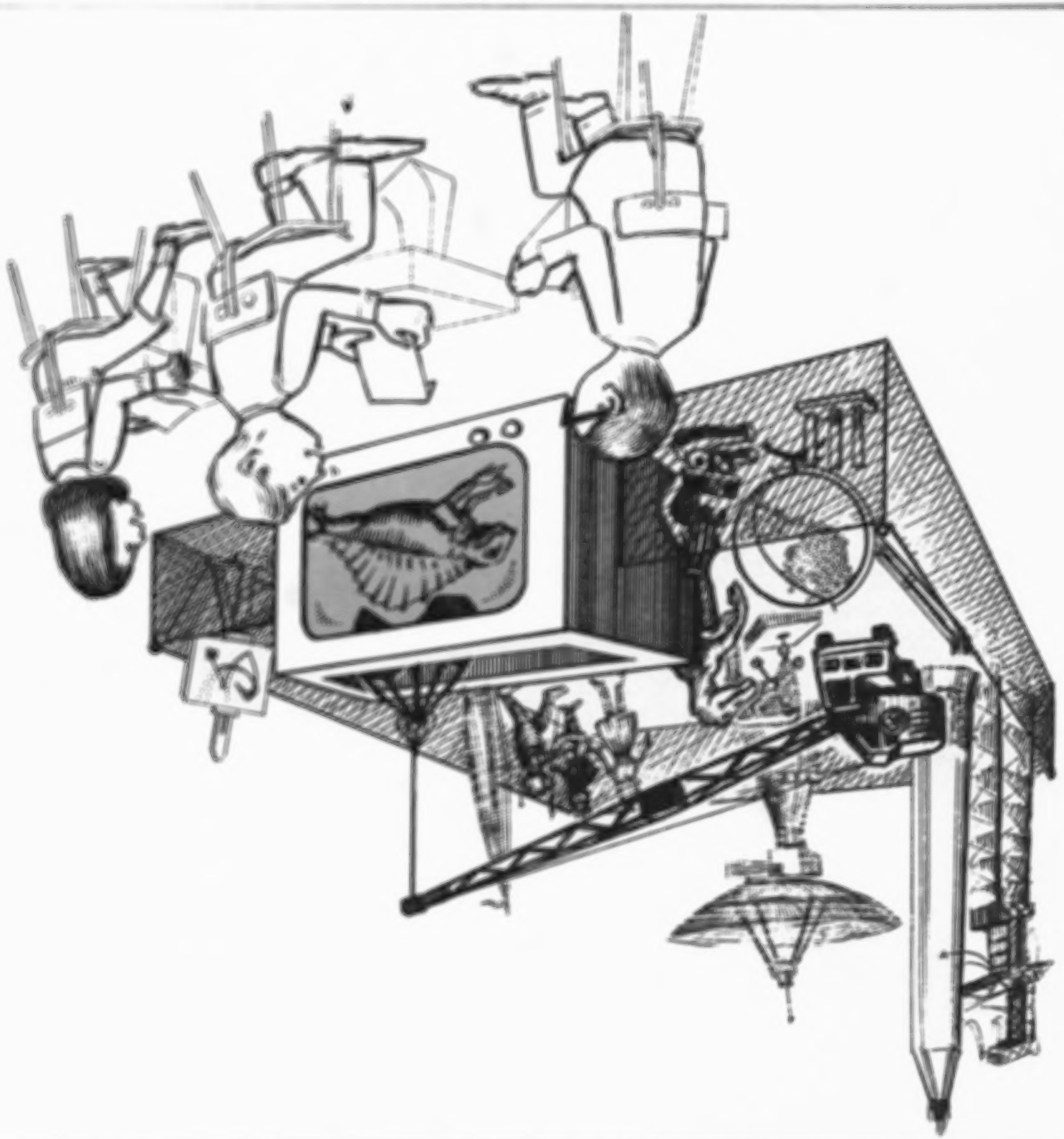


TABLE B

SUBJECTS TELEVISED 1956-1957		SUBJECTS TELEVISED 1960-1961	
GRADE	SUBJECT	GRADE	SUBJECT
1	READING, ART	1	READING, ARITHMETIC, ART, MUSIC, SCIENCE
2	READING, ARITHMETIC, ART	2	READING, ARITHMETIC, ART, MUSIC, SCIENCE
3	ARITHMETIC, ART	3	READING, ARITHMETIC, ART, MUSIC, SCIENCE, SOCIAL STUDIES
4	ART, SOCIAL STUDIES, MUSIC	4	READING, ARITHMETIC, ART, MUSIC, SOCIAL STUDIES, CONVERSATIONAL FRENCH
5	ART, MUSIC, ARITHMETIC	5	READING, ARITHMETIC, ART, MUSIC, SOCIAL STUDIES, CONVERSATIONAL FRENCH
6	ART, MUSIC, SCIENCE	6	READING, ARITHMETIC, ART, MUSIC, CONVERSATIONAL FRENCH
7	NONE	7	CORE, GENERAL MATHEMATICS A, GENERAL MATHEMATICS B, SCIENCE, PRACTICAL ARTS, CONVERSATIONAL FRENCH
8	NONE	8	CORE, GENERAL MATHEMATICS, ALGEBRA, SCIENCE, PRACTICAL ARTS
9	GENERAL SCIENCE	9	BIOLOGY
10	PLANE GEOMETRY	10	PLANE GEOMETRY
11	U. S. HISTORY	11	U. S. HISTORY, CHEMISTRY
12	ACADEMIC AND GENERAL ENGLISH	12	ACADEMIC AND GENERAL ENGLISH, PHYSICS, MATH FOR MATHEMATICIANS
7-12	GUIDANCE	7-12	GUIDANCE

PUPILS AND TELEVISION

Many studies have shown that children learn from television, but Washington County's experience indicates that they often achieve much more from a combination of classroom and television instruction than from classroom instruction alone. Test results supporting this conclusion will be found in Part II of this report. Before looking at these results, it might be worthwhile to consider some of the subjective reactions of pupils to classroom television.

As almost every parent knows, there is something fascinating about television, perhaps especially so for children. Television rivets the attention—and this can happen just as easily in the classroom as in the living room. Not just any lesson will command attention, of course, but the well-planned, well-taught lesson will do so to a degree that is seldom achieved in the conventional classroom.

Many factors help to produce this effect—the skill of the studio teacher; the great variety and change of pace that television makes possible; the screen's capacity for controlling, directing and holding attention, showing only what is pertinent and excluding the extraneous. Still another factor is the studio teacher's habit of looking directly into the camera lens as he talks. Every pupil watching the screen has the impression that the teacher is not only looking at him, but also talking directly to him.

In the conventional classroom, there are far more distractions. Every teacher knows how easily a class can be interrupted—by a pupil's intentionally distracting question, by a visitor, by the scream of automobile tires outside—and how such incidents interfere with learning. When a television lesson is in progress, a class is much harder to distract. The disruptive question is not asked, because all questions must wait until the telecast is completed. Usual distractions are more likely to pass unnoticed by pupils participating in a television class. But if the class should be interrupted for a moment, the pupil's attention returns quickly to the lesson. While a classroom teacher might pause until a disturbance ends, the studio teacher does not. He continues with the lesson. The pupils tend to pay attention because they know that what he is saying will not be repeated.

The attention-holding quality of television is not something that slackens

with time. Television is no longer a novelty in Washington County, but the attention it commands in the classroom is just as great as ever. In 1956, though, television was a novelty in the county's classrooms. This created certain problems. Pupils were used to watching television in their homes, and they often brought their home viewing habits into the classroom. When the set was turned on, many pupils relaxed and assumed the familiar television slouch. They expected from school television the same thing that commercial television usually offers —entertainment. They expected only to watch something happen. They did not expect to have to contribute anything themselves.

A television lesson should not be a passive experience, and there is no reason why it need be. As used in Washington County, television requires the pupil to be alert and to observe carefully throughout the lesson. The pupil knows the studio teacher is going to go over the lesson only once, and he learns that he must listen more carefully than perhaps he once did. Often, too, he must take notes. And the studio teacher not only provides information and stimulates the growth of ideas; he also strives to make the pupil think critically, exercise judgment and develop a spirit of inquiry. Once the pupil begins doing these things, he is involved in the lesson. He is not just sitting, watching something happen on the screen in front of him.

Teachers both in the studio and the classroom place heavy emphasis on making pupils assume more responsibility for their own learning—both in and outside the classroom. And, if this is to be achieved, pupils have to abandon the habit of watching television passively. It required time to accomplish this change in viewing habits during the first year of the television project. But now pupils who have had television classes know what to expect, and they have acquired new habits. They are more alert, more interested, more thoughtful.

This increased attentiveness on the part of pupils creates a challenge for teachers and promotes improvement in the curriculum as well. It has a marked effect on learning, and this shows up in test results. It also has an effect which apparently continues for many pupils after they leave school. Quite a few high

school graduates come back to tell their teachers that the disciplines they learned through television lessons — note-taking and paying close attention — have been a great help to them in adjusting to college.

Television is often referred to as one of the mass media — and of course it is. But from this, some draw the conclusion that those who watch television react to it *en masse*. Going one step further, they express the fear that television in the classroom risks the destruction of individuality among pupils—that it is an assembly-line educational process which brings about conformity and uniformity. It is easy enough to imagine deliberate use of television to foster conformity, and certainly it is necessary to guard against any such practice. But there is no necessity to use television in this manner. If a school system is reasonably alert, the problem can be easily avoided. The ideas which foster conformity do not come from television. They come from those who use it. And no group reacts to television

en masse. Individuals react to a commercial television program or a television lesson as individuals. They judge it and are influenced by it in the light of their own experience, knowledge and values.

There is no attempt here to underestimate the potential of television for propaganda. Television is an extremely powerful medium of communication. Obviously it can be used to influence thinking, and obviously any school system would take care to avoid its misuse. But it is worth noting here that the dissemination of biased views or propaganda is much easier to control with television than when each teacher is alone with his pupils.

What do the pupils themselves think of television? On the whole, it is fair to say that pupils accept television as a standard, every-day part of their school program. A survey showed that a sizable majority find subjects presented on television more interesting and more challenging than those presented conventionally in the classrooms. Pupils believe that because of this they study harder. Pupils say, too—and teachers agree—that they take part in classroom discussion more frequently in subjects taught on television.

One reason is that pupils who fail to grasp an idea from reading often do understand it when it is explained and illustrated on television. Thus, they are better prepared for discussions. Another factor favoring discussion in television classes might be the absence of the television teacher. Pupils sometimes fail to question what a teacher says because they are afraid—sometimes with justification—of antagonizing the teacher. When the teacher who presented the lesson isn't around to be offended, discussion can be freer. Pupils also say that they talk more with their families about school and school work since instructional television began. Increased use of the library indicates improved interest and enterprise.

Not all pupils say that they like television. A minority say that they do not. But the reasons that many of them give for this are enlightening, and most educators would regard them as reasons which favor the use of television. For example, some children say that they do not like television because they dislike taking

notes, or because they have to pay close attention to what the teacher is saying. A few blame television for their failures; but those seem, for the most part, to be those who would, if there were no television, be blaming something else for their lack of success.

Pupils themselves, then, believe—as do their teachers—that television makes them study harder and listen more attentively. At this point, it is worth listening to the views of an elementary school principal. Her opinion is based on long experience and parallels the views of many other experienced teachers and principals.

"Since television has been used," this principal said, "children and teachers are more excited about school. They find it more challenging. A classroom teacher working with a group of children from day to day can easily develop routines that are boring. Teaching by television brings variety to the classroom.

"Then too, children learn more with television. When a classroom teacher plans a lesson, she thinks, 'If I'm lucky maybe I can accomplish this much today.' A television teacher doesn't plan that way. With the help of classroom teachers she outlines the course for the whole year, and she knows what I should include in order that she carries out her plans. The pupils are required to pay closer attention, they work harder, and they are more alert. Not every child can read a book quickly and well, but they can participate in a television lesson and frequently learn more from it than they would from the printed page.

"Another thing. Before television, when we teachers spent long periods of time helping the slow learners, the bright ones suffered. Now all gain a great deal from the television lesson, and after it's over we can set the bright ones to work while we help the slow ones. This way everybody comes out a little farther ahead."

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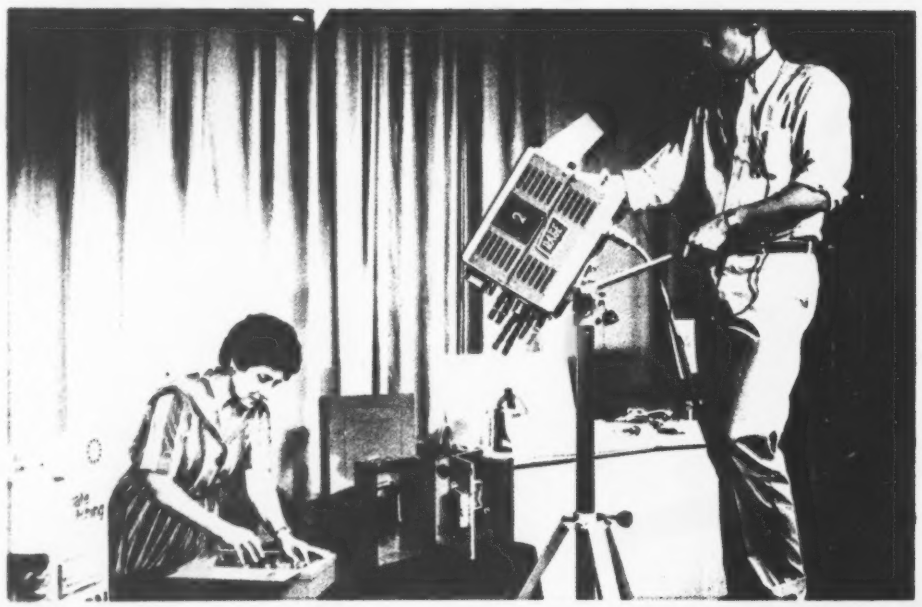


TEACHERS AND TELEVISION

The impact of television on the Washington County school system has been great—far greater than anyone could have predicted in 1956. Nowhere has this impact been more obvious than in the area of teaching and teaching methods.

Television has made the talents of some of the county's teachers far more widely available than they were before. This benefits not only the pupils, but also many other teachers who, for the first time, have an opportunity to watch their colleagues at work. When this first happened, teachers with thirty years' experience sometimes discovered, often to their surprise, that there were quite a few teaching techniques they had not known about. Before television, these teachers had to depend largely on theory and experience to guide them. Now they have a daily opportunity to watch and weigh the methods and theories of others, and to see how these work out in practice. For most teachers, this has been an enlightening experience.

It has provided on-the-job training never before possible.

An even more notable change brought by television has been the establishment of teaching teams. The teacher in the studio and the teachers in the classroom comprise the team.

The studio teacher concentrates on preparing his lesson and presenting it with maximum effectiveness. He tries to avoid monotonous lecturing and to vary his presentation with the many techniques television makes available. He provides information, but he also tries to provoke the class' interest in that information. He raises questions to make the pupils think. Just as a good classroom teacher does, he strives to get his pupils involved and interested in the subject, so that they will want to learn about it on their own initiative.

The classroom teacher's task falls into two parts. He prepares the pupils for the television lesson, and after it is over, he guides them in related classroom work. The studio teacher cannot answer questions, discuss the lesson with the class, help pupils apply what they have learned, or provide individual help. All these things must be done by the classroom teacher.

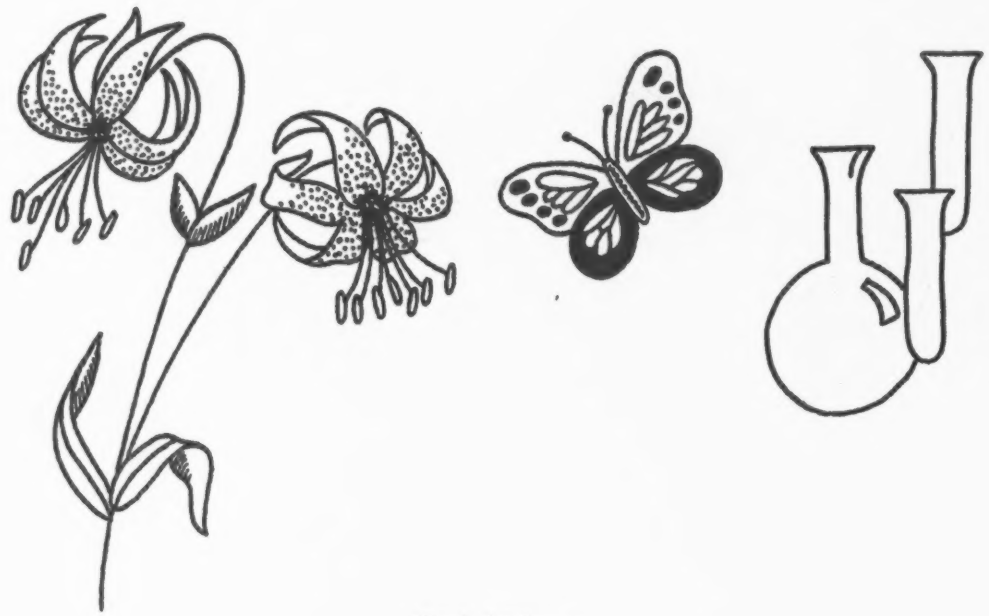
It is essential that both studio and classroom teacher recognize and understand each other's responsibilities and that they cooperate with each other.

STUDIO TEACHERS

No one studio teacher's job is exactly like another's. The lessons given by one may reach 2,000 pupils of widely ranging abilities. Those of another may be directed to 350 pupils of quite similar abilities. One teacher may teach five television lessons a week in front of a television camera, while another may teach three. Some teachers responsible for a limited number of studio lessons a week are conducting follow-up activities with classroom groups. The able teacher, with ample time to plan and study, can produce lessons of a quality seldom attained in the conventional classroom.

Any classroom teacher is aware that working five or six periods a day and being all things to thirty children leaves little time or energy for planning lessons. But the television teacher, relieved of all classroom routine, can keep his material up to date and plan his lessons with a care and ingenuity that would be impossible for the classroom teacher. This should produce better lessons and better-organized courses; and in Washington County this has, in fact, been the case. It is no exaggeration to say that in some classrooms in recent years, classroom teachers have been learning along with the pupils.

The studio teacher does face certain difficulties. One often noted is that he cannot see his pupils or their reactions to his lesson. For this reason the studio teacher finds it necessary to keep in close contact with classroom teachers. Occasionally he tapes his lesson in advance so that he may go to a school to observe how the lesson is received in the classroom. However, the studio teacher must rely to a considerable extent on past experience to tell him how a class will react to what he says and does.



Grade 5 Science

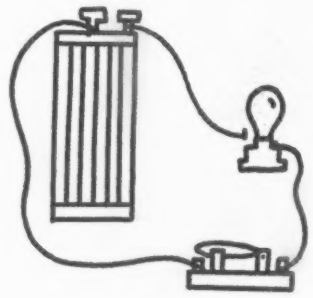
1:00 P.M.
Tuesday and Friday

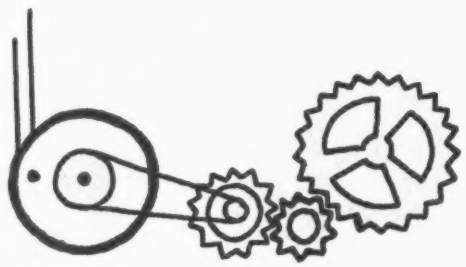
Channel 2
1963-1964

The changes in the science program are minor ones. The beginning lesson on the scientific method has been eliminated - the first lesson begins with the grouping of animals. There is an additional lesson on invertebrates, and an additional lesson at the end of the animal unit that deals with health and man.

The content and placement of the lessons are basically the same as last year's.

May you have a wonderful year in science!





There is potential difficulty in the fact that television makes it possible to include far more in a lesson than could be done in the classroom. Distractions and interruptions of the conventional classroom are not present in a television studio, and the pace of the lesson increases. An experiment at New York University showed that a televised literature course covered three times more material than did a conventional course. To a point, this increase in pace is an advantage. There may come a time when the pace is too swift, or when coverage of more material would have little real value. The studio teacher must be aware of this danger.

Washington County's teachers are paid according to the same scale whether they work in the studio or in the classroom. The range is $4400 to $7500 a year for the ten-month school year. Additional remuneration is given for summer employment. Studio teachers are chosen from the regular county staff on the basis of experience and ability. It is, of course, vital to find and use good teachers on television. But it is not axiomatic that the good classroom teacher will make a good studio teacher. Nor is a mediocre classroom teacher always mediocre on television. The run-of-the-mill classroom teacher may suddenly come to life on television, and the excellent classroom teacher may find himself unable to adapt to the medium. There are those who find that they do not like teaching without a class in front of them, and there are those who discover that they like it better. Some avoid teaching on television because, for them, there is too much tension involved. The pressure of timing and cues, the need always to have lessons completely and thoroughly prepared for a given deadline—all this is more than some teachers want to experience. Others thrive on these things and are challenged. In general, however, skillful and imaginative classroom teachers will make good studio teachers, and there should be enough of them in the average school system to provide a television staff.

CLASSROOM TEACHERS

In Washington County, classroom teachers bear considerable responsibility for the content and effectiveness of television lessons even though they do not present them. The content of each course is planned in workshops and meetings during the summer and throughout the school year. Both studio and classroom teachers participate in these sessions, and both contribute to them. When the studio teachers eventually present the lessons on television, all classroom teachers are encouraged to evaluate their effectiveness. They are provided with "feedback" cards on which they can point out which aspects of a lesson failed and which succeeded. (See illustration page 35.) The comments made on these cards serve as a guide to studio teachers, and the suggestions are frequently adopted.

Bulletins describing the details of courses are developed in the various workshops and meetings held each year. These guides are distributed to the schools well in advance of the lesson date, and classroom teachers use them in preparing pupils for the lesson and the discussion which follows. A guide might include a brief outline of concepts to be presented during the lesson, and an explanation of the approach to be used in the telecast. (see illustration) It would also include a list of new vocabulary, text

references, and suggestions for activities that might precede or follow the telecast.

Once the television lesson is over, the classroom teacher uses this guide plus his own ingenuity. Where the studio teacher has raised questions, the classroom teacher helps the pupils search for answers, or shows them how they might use the information they have acquired. He discusses the lesson with them, helps clear up misunderstandings, and has more time available than ever before to aid pupils who need special attention. When, for example, a televised arithmetic lesson ends, the teacher has a fairly clear idea which pupils understood the lesson. These pupils can work on their own, perhaps learning something new. Another group might have understood the lesson but can, with profit, be put to work on problems that provide extra practice. The teacher can then devote himself to the third group—those who had difficulty with the lesson and need a fuller explanation of it.

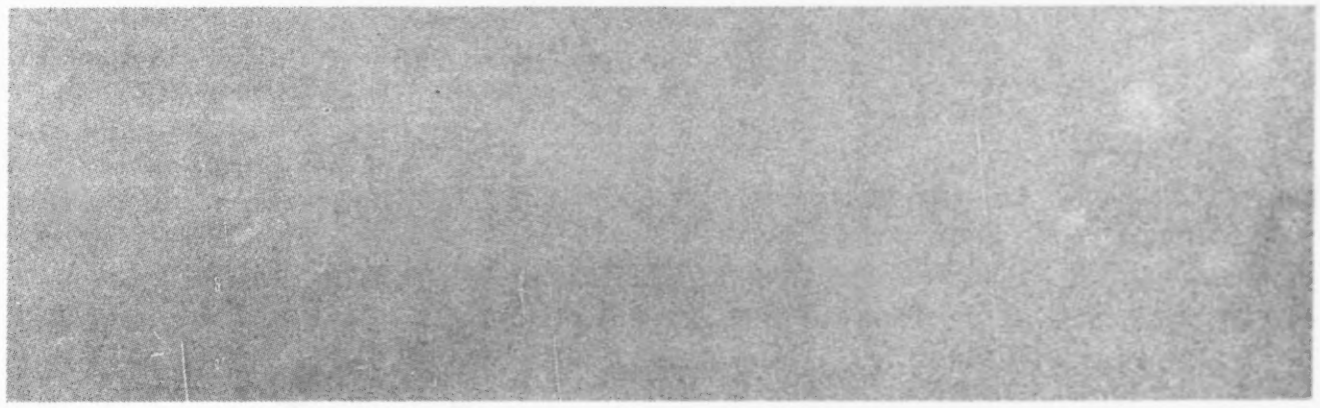
The success or failure of the studio teacher's efforts will, in the end, depend heavily on the performance of the classroom teacher. The teacher in the studio may do a superb job, but this will count for little if the teacher in the classroom fails in his half of the task. Studio and classroom teachers must, in short, work as a team and support each other's efforts.

School Antietam Grade 4 Subject Arith.
Classroom Teacher Lorelei Bowers No. of Students 18 Lesson Date 12/12/58
Level of Student Ability: Above Average ___ Average ✓ Below Average ___

1. Sound: Distinct ___ Audible ✓ Not Clear ___ Describe Difficulty _____
2. Video: Clear ✓ Interference ___ Describe Difficulty _____
3. Introduction: Stimulating ___ All Right ✓ Dull ___
4. Development: Clear ✓ Interesting ___ Weak ___
5. Visuals: Enough ✓ Too Many ___ Too Few ___
   Shown Long Enough ✓ Not Long Enough ___ (Which One) _____
   Effective ✓ Didn't Make the Point ___ (Which One) _____
6. Speed of Lesson: Right ✓ Too Fast ___ Too Slow ___
7. Vocabulary: Right ✓ Too Difficult ___ Too Easy ___
8. Level of Lesson for Students: Too Difficult ___ Satisfactory ✓ Too Elementary ___
9. Amount of Student Participation During TV Lesson: Inadequate ___ Adequate ✓ Too Much ___
10. Summary: Effective ___ All Right ✓ Omitted ___
11. Length of Telecast: Right ✓ Too Long ___ Too Short ___
12. Amount of Student Participation After Telecast: Inadequate ___ Adequate ✓
13. Student Interest: Good

T _____
P _____
E _____

-USE OTHER SIDE FOR SUGGESTIONS AND COMMENTS-



Because this is true, every effort is made in Washington County to promote continuing communication between studio and classroom teacher. This is accomplished through workshops, conferences, studio teachers' visits to the schools, and through the "feed-back" cards. And it is vital to the success of the teaching team system. Only in this way can the studio teacher maintain contact with the classroom, and the classroom teacher make his needs felt in the television studio.

Since close cooperation between studio and classroom teachers is necessary, it is especially important to consider what teachers think of television. If, on the whole, they are indifferent toward it, or if they dislike it, neither the teaching team nor the television lesson will be of value.

The County Commissioners raised the question of teacher attitude toward television as outside financing for the project neared an end in 1961. At that time, school officials asked the commissioners to provide public funds for the continued use of television. School officials were able to demonstrate that savings made possible by television would cover costs of operating the system. But before approving any funds for 1962, the commissioners said they wanted to be certain that the teachers themselves were in favor of continuing the use of television. A questionnaire went out to 750 teachers, and 725 replied. Elaborate precautions were taken to insure anonymity. The vote showed that 90.3% of the teachers wanted to continue using television in the schools. Many teachers signed the questionnaires and added enthusiastic notes about the project.

There are, of course, teachers who are indifferent toward television, and there are some who actively dislike it. They are, as the commissioners' survey demonstrated, a distinct minority—but their attitudes are not insignificant. The teacher who disapproves of television lessons or of the studio teacher quickly communicates his attitude to the pupils. And following the classroom teacher's lead, pupils are quite likely to dismiss the television lesson and teacher as unimportant. Whatever value the lesson may have had is then lost. Such attitudes rarely appear among elementary school teachers. Elementary teachers are not specialists; they welcome help from the studio teacher, both because it is expert teaching in a subject where they may feel inadequate, and because it assists them with their

heavy teaching load. High school teachers more often object to television. As specialists in history, or English, or science, they sometimes resent the fact that a teacher in a television studio is, in part, taking over for them. But the number of such teachers was never large, and it has diminished steadily since television was first used. The benefits to be gained from television are too obvious to ignore. Perhaps a look at a few of these benefits as they affect the teacher will help explain why such an overwhelming majority of teachers find television valuable.

There is no magic in television. It is simply a mechanical device, a one-way channel of communication which has many advantages and certain shortcomings. It can be used well or poorly. A teacher can stand before a television camera and lecture for fifty-three minutes, as he might in a classroom. But this will accomplish little, because transferring the standard classroom performance to a twenty-one-inch screen merely diminishes it in size. A teacher can, however, use television to bring into the classroom, people, creatures and places that pupils could never see otherwise. The teacher is then using television to advantage.

Suppose a teacher wants to discuss [illegible]

[illegible]

There are other advantages. A chemistry experiment which might otherwise be considered too dangerous can be brought into the classroom, and so can a

There is an astonishing wealth and variety of visual and audio aids which the teacher can use on television. There are pictures, maps, film clips, slides, recordings, music, diagrams, sound effects, models, animated cards—just to name a few of the more obvious ones. Many of these are available to the teacher in the classroom, but never to the same extent that they are to the studio teacher. No school system could afford to buy for every classroom teacher the equipment available to a studio teacher. And no teacher in a classroom could use this equipment with the speed, economy and facility made possible by television. There is no need to run through a twenty-minute film to see three minutes of pertinent material. The television teacher can select the portion of the film he wants to use and have it run where he wants it in the course of his lesson.

Certain simple techniques which television makes available are valuable in teaching. The use of different camera angles and lenses can, within a matter of seconds, give views of an object—statue, cathedral, engine—from close-up, far away, from every side. The screen can be divided to show one object or scene on one side, and another object or scene on the other side for contrast or comparison. The view from one camera can be superimposed on that of another, to label a map, diagram or picture. The value of all this does not lie in the fact that television is capable of performing a multitude of visual tricks. It lies in the fact that this versatility can be used to present excellent lessons with great efficiency. The lesson presented on television can be far smoother, more varied and interesting than it could be in the classroom.

THE COMMUNITY AND TELEVISION

The value of a closed-circuit television network to the community can be great. Its potential uses to educate and to inform are both many and varied. An example is the Management Development Institute which was presented on the television network in the fall of 1962. This was an adult education project in the field of management training. The Hagerstown Chamber of Commerce, the Small Business Administration, and the Board of Education collaborated in presenting it.

The Institute consisted of eight weekly two-hour telecasts transmitted to seven high schools in the county. More than 250 businessmen each paid the Chamber of Commerce a fifteen-dollar fee to attend. During the first hour of these telecasts the businessmen heard lectures by experts from industry and the academic world. The lectures covered such topics as productivity, sales promotion, personnel, and wage administration. In the second hour of each session, there was a discussion period at each school. Questions developed during the first half hour of discussion were telephoned to the Television Center, and during the second half hour the lecturers answered these questions on television.

The Small Business Administration is circulating kinescopes of this series

throughout the country. The S.B.A. reported recently that within two months after the series ended, there had been 300 requests for it.

There are many possibilities for any community to use television for such programs. Among those that have been offered in Washington County are a speed reading course for adults, and a series of four telecasts given annually at tax time by experts from the local Internal Revenue Service office. The television network has also been used for U.S. Savings Bond and Community Chest drives and by the Boy Scouts, the Red Cross, the Civil Defense, and the P.T.A. As awareness of the network's usefulness has grown, requests for it have increased.

Quite aside from any use of the network by community organizations, the school system can use it to inform the community about school affairs. This has been done on occasion in Washington County. School administrators have, in fact, carried on an effort from the beginning to involve parents and community leaders in the development of the television program—or, at the very minimum, to keep them well-informed about it. Parents and community leaders were represented on the steering committee which set up the original plans for the television project, and they took part in the later summer workshops.

Starting in 1957, Triangle Publications (publishers of "TV Guide") provided the county free for two years a special, weekly school edition of their magazine. The magazine provided both pupils and their parents with details of the lessons being telecast, special articles about school and community events, and lists of commercial television programs suggested by teachers for home viewing. The county assumed publication of the guide in 1959 and continued it for two years. The guide was discontinued after outside financing for the television project ended.

The community is, for the most part, well-informed about the use of television in the county's schools, and parents accept it as a worthwhile addition to the educational system. If anything, tele-

vision has increased their interest in school affairs and in education generally.

COSTS

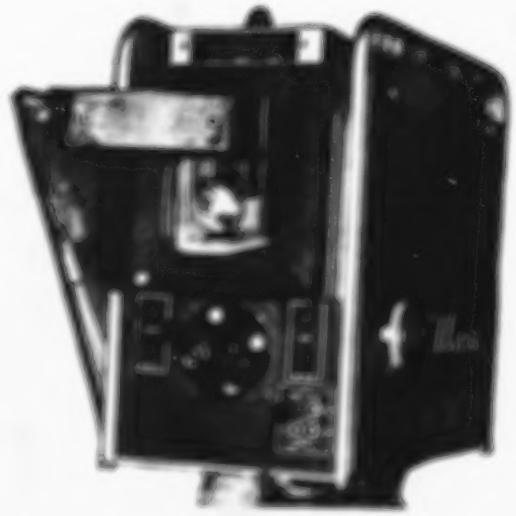
The cost of establishing the Washington County closed-circuit television system and operating it for the five years of the project—excluding telephone company cable installation costs—was about $1,300,000. Today the annual operating cost is about $280,000. But neither figure should be taken as a precise guide to the cost of setting up and operating a similar system elsewhere.

In fact, the cost of establishing a comparable system might well prove to be lower. Because Washington County's system was a pioneering effort, it seems reasonable to expect that communities which can benefit by the county's experience will have somewhat lower costs.

Some savings should now be possible, for example, on equipment. The equipment used in Washington County was contributed by seventy-five manufacturers who belonged to the Electronic Industries Association. Its value, based on manufacturers' prices at the time, was about $300,000. Since that time, less expensive equipment has become available. In 1958, the county acquired a video-tape recorder valued at $45,000. Similar equipment today costs approximately the same; but small portable models are now coming on the market at $12,000.

When the project began, standard living room television sets were used in the classroom because they were the only suitable sets available. Now sets designed especially for classroom use can be purchased. They are more rugged, and they have a sound system better geared to the classroom situation.

The Television Center's engineering department has prepared a guide to minimum equipment requirements for a single television studio. This includes the following:



STUDIO EQUIPMENT

- Two professional videon cameras with viewfinders
- Two sound dollies
- Six to eight lenses (one-half to six inches)
- Two microphones
- Lighting equipment
- Video monitor

CONTROL ROOM EQUIPMENT

- Remote control for cameras
- Video and waveform monitors for cameras and line
- Video switcher
- Turntable
- Audio console
- Sync generator
- Transmitter

Today the total cost of this equipment might range from $18,000 to $36,000. With fairly good equipment throughout, the cost would be about $25,000 per studio. Equipping an adequate film room would cost another $15,000.

The Ford Foundation and its Fund for the Advancement of Education underwrote much of the initial cost of the project. Their contributions amounted to approximately $200,000 a year over the five-year life of the project. This money covered costs of designing the system, training teachers in workshops prior to and during the project, and paying cable rental fees. It paid for some equipment, and it covered certain administrative, clerical, production and engineering costs. It also paid for evaluation of the program.

In 1959, a more or less typical year (except for cable costs, which later increased as more schools were added), the foundation grants were used as follows:

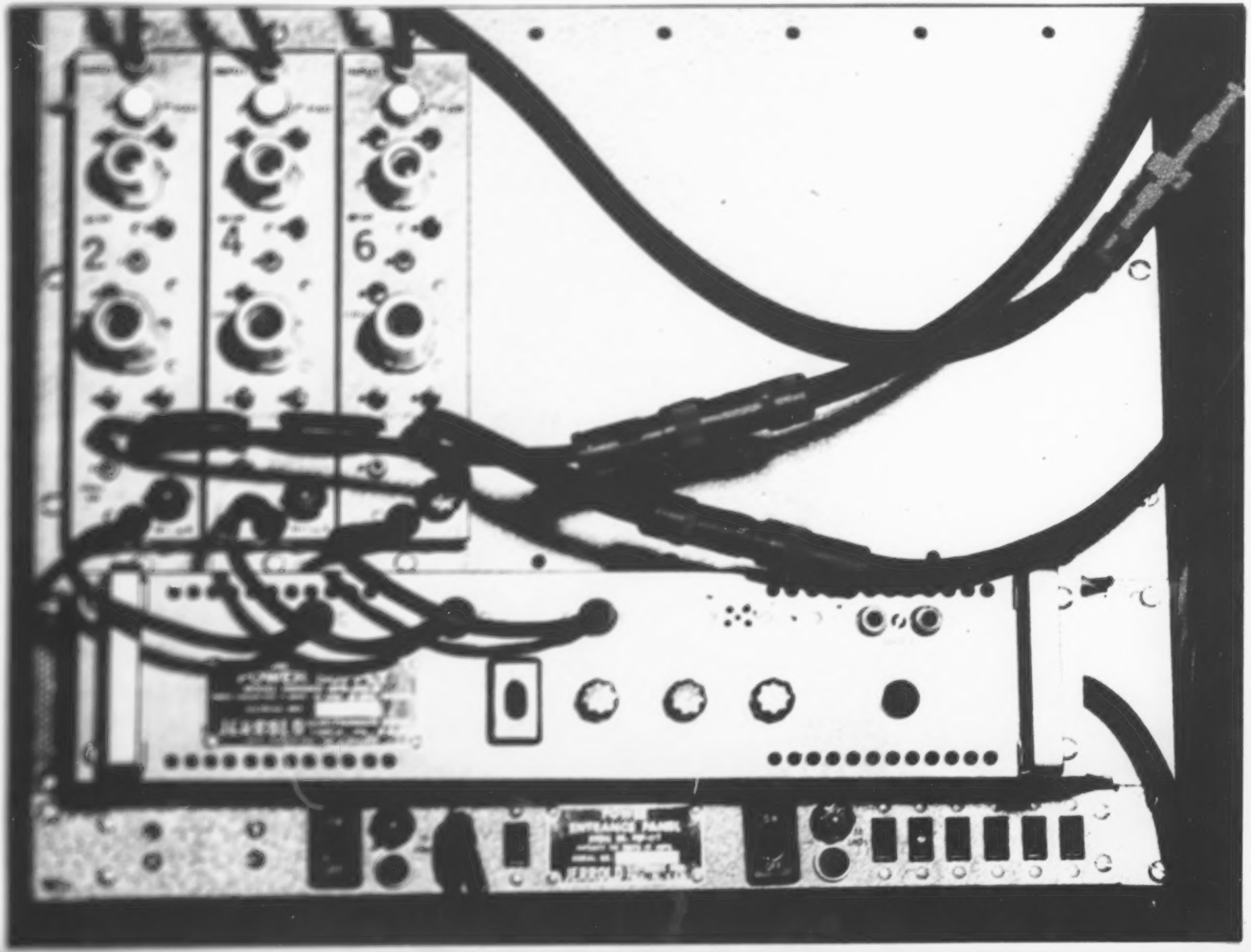
Cable charges	$ 81,073.00
Equipment	11,846.37
Salaries	118,226.60
TV Workshop	23,559.26
Travel	3,960.63
Supplies	3,464.29

The salary item listed above includes the cost of supervisory, administrative, engineering and production personnel. The salaries of studio teachers are not included in the cost analysis of establishing and operating instructional television. These teachers, plus many more, would be needed in regular classrooms in order to carry on a comparable program.

Washington County's current operations costs should provide a fair guide to the present realities of operating a large closed-circuit television system. Here again, though, another school system of comparable size might find higher or lower costs for a variety of reasons. Current operations costs are about as follows:

The amount listed for equipment maintenance and replacement represents the amount currently being spent. The Engineering Department estimates that this figure might in time rise to about $30,000 annually, or ten per cent of the original equipment cost.

An imponderable in the cost is land and buildings. The county already owned the land and buildings now occupied by the Television Center, although the buildings had to be remodeled. The two buildings together contain about 15,000 square feet of studio and office space. If they were reproduced locally today in concrete block or brick, the costs would be $12 or $15 per square foot. Using the $15 figure, building costs would be $225,000.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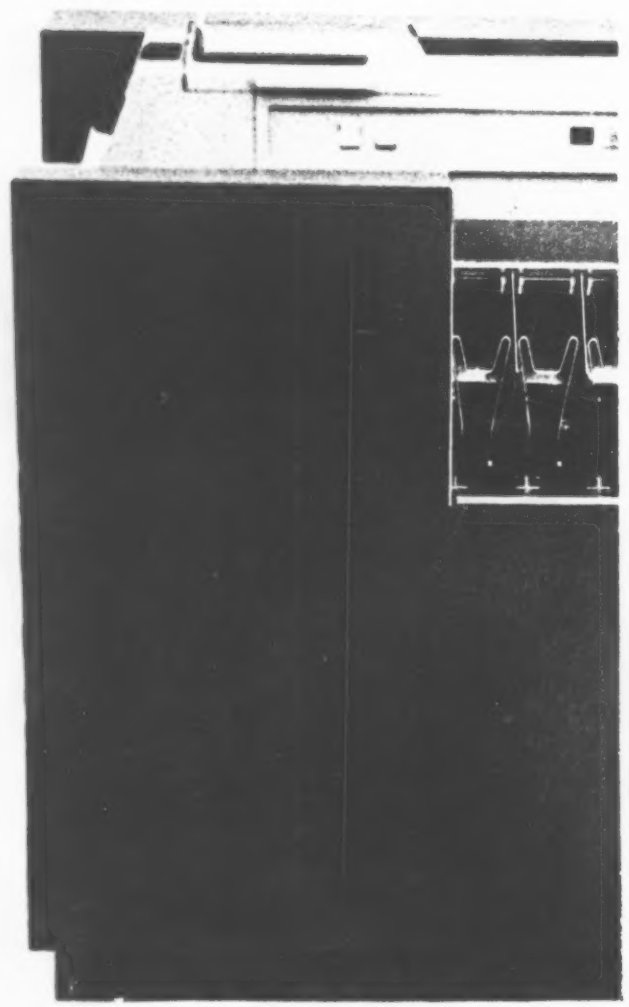
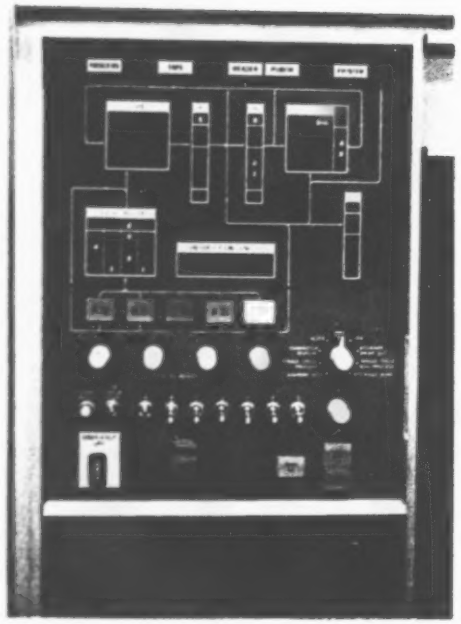
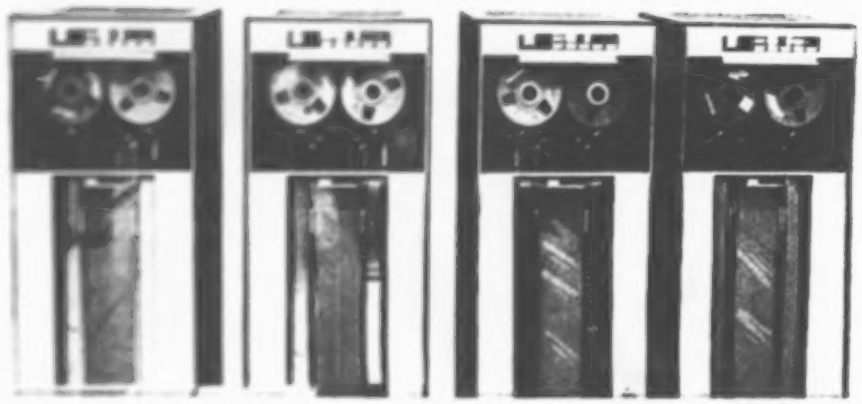
EVALUATION



PART II





AchiEvemENt

Many studies have shown that pupils learn as well with television as without it. But in Washington County pupils often achieve better—sometimes much better—in television classes than in conventional classrooms.

The reasons for this are varied. One factor, and perhaps the most important one, is this: in many early attempts to use television in the classroom, studio teachers employed traditional classroom methods. They made little use of television's special advantages. Washington County has tried to avoid this. The county teaching staff has tried to capitalize on television's unusual capabilities, and to use them as an addition to ordinary classroom activity, not as a substitute for it. Studio teachers, in other words, try to provide what the classroom teacher cannot.

Other factors have been important, too. Television has been used more extensively over a longer period in Washington County schools than anywhere else. This has focused attention on improvement of curriculum and teaching methods in a way and to an extent never before possible, and this attention to curriculum and to teaching methods has had a direct bearing on test results.

The evaluation program grew out of decisions made at the planning workshops and the experiences of the project as it evolved. Both subjective and objective data were collected for evaluation. Surveys of reactions to television lessons were made by questionnaire and interview techniques. Opinions and judgments of teachers, principals, parents, and pupils were discussed, studied, and evaluated. The county testing program was maintained and expanded in basic subject areas to obtain data for measuring the effectiveness of instruction by television.

The evaluation is based on:

1. An analysis of data showing pupil achievement in basic subject areas

2. A survey of the opinions of teachers, pupils, parents, and the general public about the use of television in the school program

3. A study of administrative and instructional problems growing out of the use of television for direct instruction

4. An investigation of the variety of learning experiences and unique educational opportunities provided by television

5. An examination of the use of the closed-circuit television facilities for informing and serving the public

These results are outlined, subject by subject, on the following pages. In brief, they show that:

The use of television as a teaching aid can bring substantially improved achievement. In many courses taught with the aid of television the increase is statistically significant. Interpretation of the data collected on pupil achievement was used by James D. Morgan, county supervisor of testing, for a doctoral dissertation. His study was approved and accepted by testing research specialists at Teachers College, Columbia University.

During the project, rural groups advanced from a lower achievement level to a position comparable to that of urban groups.

Achievement can improve year by year with television, long after any novelty effect has worn off.

MATHEMATICS

Mathematics became the most extensively-taught part of the television curriculum for several reasons. The subject matter was objective, and standard tests were available. This made careful evaluation possible. Beyond that, the staff had a special interest in learning how mathematics would lend itself to television teaching. The subject had long been regarded as one that required face-to-face teaching, and much individual guidance. But in Washington County, the mathematics curriculum was already being revised to make it more meaningful, and the staff wanted to test these revisions.

Courses taught on television included arithmetic in grades one through six; general mathematics in grades seven and eight; algebra in grade eight; geometry in grade ten; advanced mathematics in grade twelve. Pupils received as many as five consecutive years of mathematics instruction during the project. And achievement grew to such an extent that the junior and senior high school mathematics programs required upgrading.

THE ARITHMETIC PROGRAM

In the project's first year, ten-minute arithmetic lessons were telecast once a week for the second and third grades. The fifth grade had a more comprehensive program, with television lessons that lasted from ten to thirty minutes each day. The studio teacher concentrated on arithmetical concepts and principles of problem-solving, while the classroom teacher helped pupils put this information to use.

Grade five pupils took the Iowa Test of Basic Skills in September, 1956, and again in May, 1957. The test covered 286 pupils enrolled in six Hagerstown schools, and it showed this increase in achievement:

The table shows that in nine months, fifth grade pupils made almost two years' growth in arithmetic—from five months below grade level to four months above it. This unusual achievement led to the development of television instruction in arithmetic for all elementary grades by the 1957-1958 school year. Grades three through six received four telecasts a week, while grades one and two received one telecast a week at first, and later, two.

Table II shows the average achievement after the first year of television arithmetic lessons for grades three through six in both urban and rural schools. Grade three pupils took an S.R.A. Achievement Series test, other pupils, the Iowa Test of Basic Skills.

It is worth noting that:

1. More than one year's growth in achievement occurred in every grade in arithmetic concepts and in every grade but one in problem solving.

2. The average achievement for all schools at the end of the year was above the national norm for every grade in arithmetic concepts, and in all but two

TABLE I	GROWTH IN ARITHMETIC CONCEPTS — GRADE 5		
[illegible]	[illegible]	HAGERSTOWN PUPILS MEDIAN SCORE MAY, 1957	GROWTH SEPT., 1956-MAY, 1957
[illegible]	[illegible]	6.4	1.9

grades in rural schools in problem solving. Grade six urban school pupils had received televised arithmetic lessons in grade five, and they were the only pupils in the county whose score was above the national norm in September, 1957. The other pupils tested had not had television lessons before September, 1957.

The substantial first-year gain in arithmetic achievement was maintained and improved upon during the remainder of the project. Tables III-A and III-B show achievement results in arithmetic concepts and problem solving for grades three to six in both urban and rural schools over a four-year period.

TABLE III	URBAN SCHOOLS					
	AVERAGE GRADE EQUIVALENTS ARITHMETIC CONCEPTS			AVERAGE GRADE EQUIVALENTS PROBLEM SOLVING		
GRADE	SEPT., 1957	MAY, 1958	GROWTH	SEPT., 1957	MAY, 1958	GROWTH
3	3.76	4.24	1.48	2.85	4.22	1.37
4	4.01	5.08	1.07	4.05	5.03	.98
5	4.58	5.99	1.41	4.60	6.14	1.54
6	6.20	7.37	1.17	6.13	7.20	1.07
	RURAL SCHOOLS					
3	2.66	4.06	1.40	2.70	3.94	1.24
4	3.59	4.97	1.38	3.79	4.94	1.15
5	4.43	5.77	1.34	4.49	5.71	1.22
6	5.26	6.83	1.57	5.34	6.75	1.41

TABLE III-A		URBAN SCHOOLS — CONCEPTS			
		GRADE 3	GRADE 4	GRADE 5	GRADE 6
		3.9	4.9	5.9	6.9
	1958	4.34	5.08	5.99	7.37
	1959	4.55	5.22	6.27	7.42
	1960	4.77	5.42	6.40	7.59
	1961	4.89	5.32	6.38	7.48
		URBAN SCHOOLS — PROBLEM SOLVING			
	1958	4.23	5.03	6.14	7.20
	1959	4.36	5.28	6.23	7.34
	1960	4.32	5.36	6.28	7.56
	1961	4.33	5.23	6.21	7.43

TABLE III-B		RURAL SCHOOLS — CONCEPTS				
		GRADE 3	GRADE 4	GRADE 5	GRADE 6	
		3.9	4.9	5.9	6.9	BEFORE TELEVISION
	1958	3.59	4.43	5.26	6.49	1 yr.
	1959	4.06	4.97	5.77	6.83	2 yrs.
	1960	4.18	5.01	6.13	7.17	3 yrs.
	1961	4.30	5.08	6.19	7.28	
		RURAL SCHOOLS — PROBLEM SOLVING				
	1958	3.79	4.49	5.34	6.70	BEFORE TELEVISION
	1959	3.96	4.96	5.71	6.75	1 yr.
	1960	4.05	4.92	6.03	7.07	2 yrs.
	1961	4.17	5.10	6.11	7.24	3 yrs.

Some points worth noting in Tables [illegible] and [illegible] are:

1. After three years of television instruction, achievement in rural schools increased to a point comparable to that of urban schools. This occurred despite a broad range of differences in home and community background.

2. Achievement in arithmetic concepts increased more than in problem solving. Gains in problem solving tended to come after improvement in concepts, possibly because concepts received the greater emphasis in the television lessons.

3. Children of different ages responded similarly to television. Achievement gains were made in both upper and lower elementary grades.

4. Average scores during the project's final year were above the ninetieth percentile. This means that they surpassed the scores obtained in ninety per cent of all schools studied in determining national norms.

Not only did Washington County have an average grade equivalent higher than the national norm in the various grades, but also the number of individual pupils achieving above the norm continued to grow during the project. The sixth grade often as example, shown in Table IV.

High achievement in sixth grade arithmetic also increased dramatically during the project. In May, 1958, thirty-four per cent of the urban sixth grade pupils were achieving above the eighth grade level. This increased to forty-two per cent in 1961. In rural schools, only ten per cent of the pupils were above eighth grade level before television. This increased to thirty-four per cent in 1961.

The implications of growth were also studied. Table V shows the number of pupils performing at each level of achievement in a hypothetical classroom of thirty pupils over a four-year period.

TABLE IV	ARITHMETIC CONCEPTS PER CENT ABOVE AND BELOW THE NORM OF 6.9 IN MAY			
	URBAN PUPILS		RURAL PUPILS	
MAY	PER CENT ABOVE NORM	PER CENT BELOW NORM	PER CENT ABOVE NORM	PER CENT BELOW NORM
1958	[illegible]	[illegible]	[illegible]	[illegible]
1959*	[illegible]	[illegible]	[illegible]	[illegible]
1960	[illegible]	[illegible]	[illegible]	[illegible]
1961	[illegible]	[illegible]	[illegible]	[illegible]

* [illegible]

TABLE V			A REPRESENTATION OF THE DISTRIBUTION OF ACHIEVEMENT SCORES IN TERMS OF CLASSES OF THIRTY PUPILS TESTED IN ARITHMETIC IN GRADE SIX, MAY, 1958-1961							
YEAR	BELOW NORM	ABOVE NORM	SCORE LEVELS							
			3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
URBAN SCHOOLS										
ARITH. CONCEPTS										
1958	11	19		1	3	7	9	8	2	
1959	10	20			3	7	9	9	2	
1960	9	21		1	3	5	8	10	3	
1961	9	21		1	3	5	8	10	3	
ARITH. PROB. SOLV.										
1958	14	16		1	5	8	8	5	2	1
1959	13	17		1	4	8	7	6	3	1
1960	11	19		1	4	6	7	8	3	1
1961	12	18		1	5	6	7	6	4	1
RURAL SCHOOLS										
ARITH. CONCEPTS										
1958	19	11		4	7	8	8	3		
1959	16	14		2	8	6	8	5	1	
1960	13	17		1	5	7	8	7	2	
1961	11	19		2	3	6	9	8	2	
ARITH. PROB. SOLV.										
1958	18	12		2	7	9	6	4	1	
1959	18	12		2	9	7	6	4	2	
1960	14	16		1	5	8	9	5	1	1
1961	14	16		1	6	7	6	7	3	

Table V shows that:

1. In 1961, there were two more urban pupils above grade norm in problem solving and concepts than there were in 1958.

2. Changes were greater for rural school pupils. Improvement there occurred at each level, and there was almost a complete reversal of achievement scores in arithmetic concepts. In 1958, eleven pupils were above grade norm and nineteen below, while in 1961 nineteen were above and only eleven were below grade norm.

ARITHMETIC AND READING

Reading was not taught by television on a regular basis during the project. During the first three years, one reading lesson a week was telecast in the elementary grades. During the final three years, reading lessons were telecast in grades one through six for voluntary use by classroom teachers. But while the arithmetic lessons were part of a carefully worked-out, sequential program, the reading lessons were not. When the project began, reading and arithmetic achievement were on comparable levels in both urban and rural schools. During the project's final two years, every substantial comparison showed arithmetic achievement significantly higher than that in reading. Nevertheless, reading achievement did show small gains in both urban and rural schools.

Tables VI and VII show reading achievement for grades three, five, six and seven. All urban groups received occasional television reading lessons in 1957-1958, rural groups, none. Both groups received the same television reading lessons as of September, 1958.

TABLE VI	GRADE 3 READING VOCABULARY ACHIEVEMENT							
	SEPT. 1957		SEPT. 1958		SEPT. 1959		SEPT. 1960	
	MEAN	NO. PUPILS	MEAN	NO. PUPILS	MEAN	NO. PUPILS	MEAN	NO. PUPILS
URBAN	2.79	953	2.97	869	3.01	901	3.09	981
RURAL	2.57	382	2.72	294	2.85	384	2.92	368

TABLE VII	MEAN GRADE EQUIVALENT . . . URBAN SCHOOLS							
	READING VOCABULARY				READING COMPREHENSION			
GRADE	SEPT. '57	MAY '58	MAY '60	MAY '61	SEPT. '57	MAY '58	MAY '60	MAY '61
5			6.01	6.07			5.90	6.00
6	5.93	7.04			6.04	6.93		
7	7.59	8.13			7.69	8.26		
	MEAN GRADE EQUIVALENT . . . RURAL SCHOOLS							
5			5.60	5.68			5.48	5.63
6	5.47	6.13			5.73	6.41		
7	7.06	7.30			7.29	7.63		

Tables VI and VII show reading achievement did not suffer because of emphasis on arithmetic. In fact, for both urban and rural groups, vocabulary achievement improved three months over a four-year period. The level reached was close to the national norm. It seems possible that the richer content of all courses taught on television may have contributed to the vocabulary improvement, although vocabulary development was not the specific aim of any course.

GENERAL MATHEMATICS

Junior high school pupils received televised general mathematics lessons in large groups for fifty-three-minute periods. These were telecast twice a week in one semester and three times a week, the next. On days when there were no telecasts, pupils met in small groups for work with the classroom teacher. During the project, the mathematics program was revised, especially in the eighth grade. Because of this, formal studies were made in general mathematics for grade seven, and in algebra, for grades eight and nine.

TABLE VIII	GRADE SEVEN GENERAL MATHEMATICS				
	SEPT. 1957	MAY 1958	MAY 1959	MAY 1960	MAY 1961
URBAN SCHOOLS					
ARITHMETIC CONCEPTS					
PERCENTILE	31	53	76	86	84
GRADE EQUIV.	6.94	7.86	8.16	8.34	8.30
ARITH. PROB. SOLVING					
PERCENTILE	33	43	74	81	68
GRADE EQUIV.	7.02	7.76	8.07	8.15	8.01
RURAL SCHOOLS					
ARITHMETIC CONCEPTS					
PERCENTILE	14	16	28*	51	38
GRADE EQUIV.	6.65	7.28	7.55	7.83	7.69
ARITH. PROB. SOLVING					
PERCENTILE	15	16	18*	43	18
GRADE EQUIV.	6.81	7.38	7.43	7.76	7.43

* THESE ARE MEANS OF ACHIEVEMENT AFTER THE FIRST YEAR OF INSTRUCTION BY TELEVISION IN RURAL SCHOOLS.

Results shown in Table VIII are similar to those in the elementary grades. Greater gains came in the early years, and these levels of achievement generally were maintained and improved upon by smaller gains during the remainder of the project. Achievement was maintained in the urban schools in May, 1961, but it decreased substantially in rural schools with the same television lessons. No valid explanation for the decrease has been made.

ALGEBRA

High-level achievement on general mathematics tests increased steadily after the first few years of the project, creating a need for more advanced mathematics in earlier grades. In 1959-1960, algebra was taught for the first time in grade eight, and on television. A similar course was taught by conventional methods in grade nine. Pupils in both grades took the Lankton Algebra Test. Their performances for 1959-1960 are compared in Table IX. The grade eight results for 1960-1961 are also shown. There was no grade nine algebra course that year.

In 1959-1960, ninth grade pupils had lower average ability but better test results than eighth graders. Probably age maturity differences played a role here. In 1960-1961, the eighth graders improved in algebra to the level attained by the ninth grade the year before. This probably occurred both because the pupils in 1960-1961 had higher ability and because the television program was improved as a result of the first year's experience. The teaching of algebra in the eighth grade made it possible to provide an additional high school mathematics course.

TABLE IX

HAGERSTOWN SCHOOLS	SCHOOL YEAR 1959-60 GRADE 8	GRADE 9	SCHOOL YEAR 1960-61 GRADE 8
NUMBER OF PUPILS	426	363	368
MEAN OF I.Q.	111.40	107.75	115.08
MEAN OF ALGEBRA	110.63	114.61	114.21
PERCENTILE	64	75	74
OUTLYING SCHOOLS			
NUMBER OF PUPILS	126	160	179
MEAN OF I.Q.	108.37	104.15	112.89
MEAN OF ALGEBRA	102.31	106.09	108.41
PERCENTILE	38	49	58

TABLE X	GRADE TEN PLANE GEOMETRY			
	1958	1959	1960	1961
	URBAN SCHOOLS — MEANS (MAY)			
MENTAL ABILITY (I.Q.)	112.54	113.66	114.52	116.95
PLANE GEOMETRY —				
PERCENTILE	34	36	55	51
SCALED SCORE	50.17	50.64	55.32	54.13
	RURAL SCHOOLS — MEANS (MAY)			
MENTAL ABILITY (I.Q.)	113.76	101.61	107.02	103.64
PLANE GEOMETRY —				
PERCENTILE	31	25	26	18
SCALED SCORE	49.49	47.71	47.97	45.69

PLANE GEOMETRY

During the first four years of the project, television geometry lessons took up half of a fifty-three-minute period, and classroom discussion, the other half. In 1960-1961, the pupils watched television lessons for a full period three days a week in large groups and then divided into smaller groups for classroom sessions twice a week. The Cooperative Plane Geometry Test was given at the end of each of the remaining four years of the project, and the results are shown in Table X.

In 1960, urban achievement in plane geometry rose from the 36th to the 55th percentile. This was an interesting development, since the 1960 group was the first to receive general mathematics by television in grade eight. Rural schools failed to improve over the four years. In 1959 and 1961, the level of mental ability in these schools may have been less than adequate for high achievement. Another factor is that five rural high schools have only seventy-four to ninety-eight pupils in grade ten. This is probably too small a sampling for drawing valid conclusions.

ADVANCED MATHEMATICS

In 1958-1959, certain grade twelve pupils began voluntarily coming to school an hour early every day to take a television course in advanced mathematics. The course includes thirty-six lessons in algebra, twenty-one in analytic geometry,

and forty-four in calculus. Pupils who have gone on to college are practically unanimous in their support of the course as advance preparation for college work. Classroom teachers, who are not assigned to the course but voluntarily help pupils taking it, report that attendance is very good and that the pupils enjoy having added responsibility for their own learning. Promoting such responsibility was one of the objectives of the course. Another objective was better preparation for college mathematics. Although credit was not a goal of the course, some pupils have received college credit for it.

No suitable tests were available for this course, but results from college board examinations indicate some improvement in achievement—even though this data covers all who take the tests, not just those who took advanced mathematics.

SCIENCE

Since science plays such an important role in modern society, the need is apparent for comprehensive science instruction from kindergarten through high school. Such a program was developed during the time of the television project.

Before television, the elementary school science program varied greatly from classroom to classroom. Teachers with training and interest in science developed rich programs. Others neglected all but the barest essentials. In the upper grades, where more teachers with college training in science were available, the program was probably most appropriate for average and above-average pupils.

In the early stages of the project, plans were made to offer televised general science instruction in grades six through nine. In the sixth grade, three twenty-five-minute science lessons were telecast weekly to 1650 pupils. The Washington County chapter of the American Association of University Women in 1959 surveyed by questionnaire attitudes of teachers, pupils and parents toward these telecasts. Responses (all anonymous) came in from 94.3% of the pupils, 99% of the teachers, and 57.2% of the parents.

PUPIL REACTIONS

20.8% ***Experiments***

"I like the experiments we can do with our television teacher."

"We learn new experiments which we can show our friends and do at home."

19.2% ***Learn More***

"You can get to learn more about a lot of interesting things."

"We learn a lot more with television."

18.0% ***Television teacher has things unavailable in classroom***

"Our teacher on television has all kinds of things we can't get for our classroom."

14.7% ***Like the subject content***

10.5% ***Like the visual aids***

Asked "What do you dislike about having televised science?" the highest percentage (34.3%) replied, "Nothing." The most frequently-mentioned dislikes were:

10.9% ***Taking notes***

5.5% ***Technical difficulties***

"I don't like it when the picture or sound goes off."

The students' responses were encouraging; they indicated a real interest in learning about science. Many pupils said they wanted more homework, more experiments to perform, more material to read. Their curiosity was aroused. They were willing to work and study more.

In response to the question, "Do you think that you can learn more about science with television or without television?" three out of four (77.2%) again selected television.

TEACHER REACTIONS

Classroom teachers ought to be in the best position to evaluate a televised course. They can see the pupils' reactions to it, and they can judge its success or failure on the basis of years of experience. And teachers were almost unanimous in stating their belief that children would learn more from televised science than from their own classroom teaching.

"Do you think your pupils can learn more about science with television or without television (with you teaching the class)?" The response:

92% With television

4% Without television

4% Makes no difference

Teachers most frequently said they liked television because of the wide range of resources available to the studio teacher:

> **"The studio teacher is able to bring to the classroom audio-visual aids, resource people and instructional materials which would be almost impossible without television."**
>
> **"The children get to see many visiting people who are experts."**
>
> **"More experiments are performed than we could ever do in the classroom."**

Teachers also liked the well-planned lessons.

> **"The studio teacher devotes her full time to planning and organizing lessons which are excellent. No individual classroom teacher could possibly prepare a lesson as the studio teacher does with all the other subjects he must teach."**

Teachers also liked the "front-row seat" each child has for a telecast. Every child can simultaneously view specimens. This saves the time that would be needed for pupils individually to examine objects.

About fifty per cent of the teachers saw no disadvantage to televised science. Those who mentioned disadvantages mentioned most frequently the time of the telecast. The last period in the day is "too late for a good follow-up." Other teachers complained of occasional technical difficulties.

Asked, "If you had a choice, would you prefer to have the science class as it is now (part television and part classroom instruction) or would you prefer to teach this class without the aid of television?" the teachers responded as follows:

2% "I prefer teaching the science class by myself." (Without television)

98% "I like it as it is now."

Teachers volunteered such comments as these:

> **"I think television is wonderful for science."**
>
> **"I don't like science very much but can truthfully say I have learned a lot from the television lessons. Please continue this work."**
>
> **"It has stimulated much interest and caused children to attack research work with a desire to learn . . . I hope I never have to teach in a school where there is no television."**

PARENT REACTIONS

More than half (57.7%) of the sixth grade parents returned their questionnaires and of these, two out of three preferred television science instruction.

Asked whether they would prefer science instruction for their children with or without television, parents replied:

65.9% With television

19.9% Without television

10.3% Makes no difference

3.9% Don't know

When asked, "What changes have you noticed in your child which you think are due to having sixth grade science telecast?" thirty-two per cent of the parents said their children were more interested in science.

"He has a greater awareness of things around him."

"He has learned to become interested in living things now."

"At home he now reads, looks for pictures in magazines, and watches television programs about science."

"Our child has become interested in many different fields of science. At present he has geology as a hobby. This interest was aroused by television science."

Parents also mentioned negative changes in their children, but none were mentioned often enough to total one per cent. The most common complaints were:

"She has poorer grades." (.07%)

"It's hard on the child's eyes." (.08%)

Some other objections were:

"My child gets confused and disgusted."

"I don't think she learns as much with television."

"I don't think he understands his work as well as before television."

"He can't ask questions."

To the question, "Do you think your child learns less, more or just as much in sixth grade science with television instruction as he would in a regular classroom situation without the aid of television?" parents replied as follows:

16.8% Learns less with television

53.4% Learns more with television

21.7% Learns just as much

8.1% Don't know

TABLE XI	AVERAGE GROWTH IN SCIENCE IN GRADE SIX BY THREE ABILITY LEVELS	
ABILITY LEVELS	PUPILS RECEIVING TELEVISED LESSONS	PUPILS IN CONVENTIONAL CLASSROOMS
111-140	201 PUPILS 118 AVERAGE I.Q. 15 MONTHS' AVERAGE GROWTH	84 PUPILS 117 AVERAGE I.Q. 12 MONTHS' AVERAGE GROWTH
90-110	527 PUPILS 100 AVERAGE I.Q. 14 MONTHS' AVERAGE GROWTH	365 PUPILS 100 AVERAGE I.Q. 11 MONTHS' AVERAGE GROWTH
57-89	155 PUPILS 83 AVERAGE I.Q. 13 MONTHS' AVERAGE GROWTH	146 PUPILS 83 AVERAGE I.Q. 6 MONTHS' AVERAGE GROWTH

At the end of the 1957-1958 school year, sixth grade pupils took the Stanford Intermediate Science Test. Those who had received lessons by television showed an unusual growth in achievement, and this was particularly notable among below-average pupils. This is illustrated in Table XI.

Early television science lessons in grade six through nine overlapped in content, and the achievement range was too broad in each grade. Later courses were given at two ability levels, and the content was revised. Biology replaced general science in the ninth grade and it was taught at two levels, one emphasizing practical applications, and the other, more difficult scientific concepts. Ninth-grade general science topics were taught in the eighth grade, biological science in the seventh.

A television chemistry course for grade ten began in 1959. This also was given at two levels, for college-bound and non-college pupils. Physics is still taught largely by the classroom teacher in the eleventh grade, although some high schools use the Harvey White physics films and texts. The revision of the science program has made it possible to offer grade twelve pupils advanced chemistry, physics or biology courses in the case of college-bound students, and a special senior science course for others.

The revision of junior and senior high school science brought about a complete revamping of elementary science as well. The purpose of this was to provide continuity in grades one through six. And in the final year of the project, television science lessons were provided at each grade level in three areas: living things, earth and the universe, and matter and energy. Grades one through four receive one television science lesson weekly and have at least one discussion session with the classroom teacher. Grades five and six receive two lessons weekly.

Changes in the junior high school general science program made it difficult to test achievement. The Stanford Science Test was administered because it paralleled the Washington County program more closely than others. Not all of the test was pertinent. Nevertheless, pupils were tested on material they had covered. The results—a very imperfect measure of achievement—are shown in Table XII. These results suggest that if the program had undergone complete revision before instead of during the television project, and if the tests had covered course content, improvements might have been as great as those in arithmetic.

During the 1960-1961 school year, grade nine pupils in biology received each week via television three telecasts in large groups, followed by two class periods a week in smaller groups. Grade ten pupils took a conventional classroom biology course. Both classes later took the Nelson Biology Test, and the results are shown in Table XIII. The scores indicate that the younger pupils taught by television achieved less than the older ones taught by conventional means. But as more experience is gained in teaching this subject on television, and as the heavier elementary science program takes effect, this achievement level is expected to improve.

TABLE XII	GENERAL SCIENCE				
HAGERSTOWN SCHOOLS					
GRADE	SEPT., 1957	MAY, 1958	MAY, 1959	MAY, 1960	MAY, 1961
6	5.50 (38%)	6.92 (50%)	7.10 (54%)	6.80 (45%)	*
7			8.16 (58%)	8.16 (58%)	8.28 (60%)
8	7.36 (36%)	8.08 (37%)	9.02 (53%)	9.26 (59%)	9.20 (58%)
	OUTLYING SCHOOLS				
6	4.87 (25%)†	5.90 (29%)†	6.14 (32%)	6.36 (30%)	*
7			7.07 (38%)	7.68 (49%)	7.56 (47%)
8	6.64 (24%)†	7.51 (26%)†	8.12 (37%)	8.08 (37%)	8.67 (49%)

* NO TEST GIVEN.

† NO TELEVISION IN USE AT THIS TIME.

TABLE XIII	BIOLOGY	
HAGERSTOWN SCHOOLS	**SCHOOL YEAR 1960-1961**	
	GRADE 9	GRADE 10
NUMBER OF PUPILS	627	663
MEAN OF BIOLOGY (SCALED SCORE)	100.14	104.97
PERCENTILE	41	54
OUTLYING SCHOOLS		
NUMBER OF PUPILS	574	419
MEAN OF BIOLOGY (SCALED SCORE)	98.50	99.61
PERCENTILE	36	38

CORE

The eighth grade core program correlates social studies, language arts and English, and has as its theme, "Understanding Our American Heritage." The course includes U.S. History, current events, literature, composition, English usage, and grammar. Lessons cover such matters as the historical background of the establishment of the United States as well as present-day problems of the refugees from Cuba and their influence on America. In core, a full period of television is followed by a full period of classroom instruction.

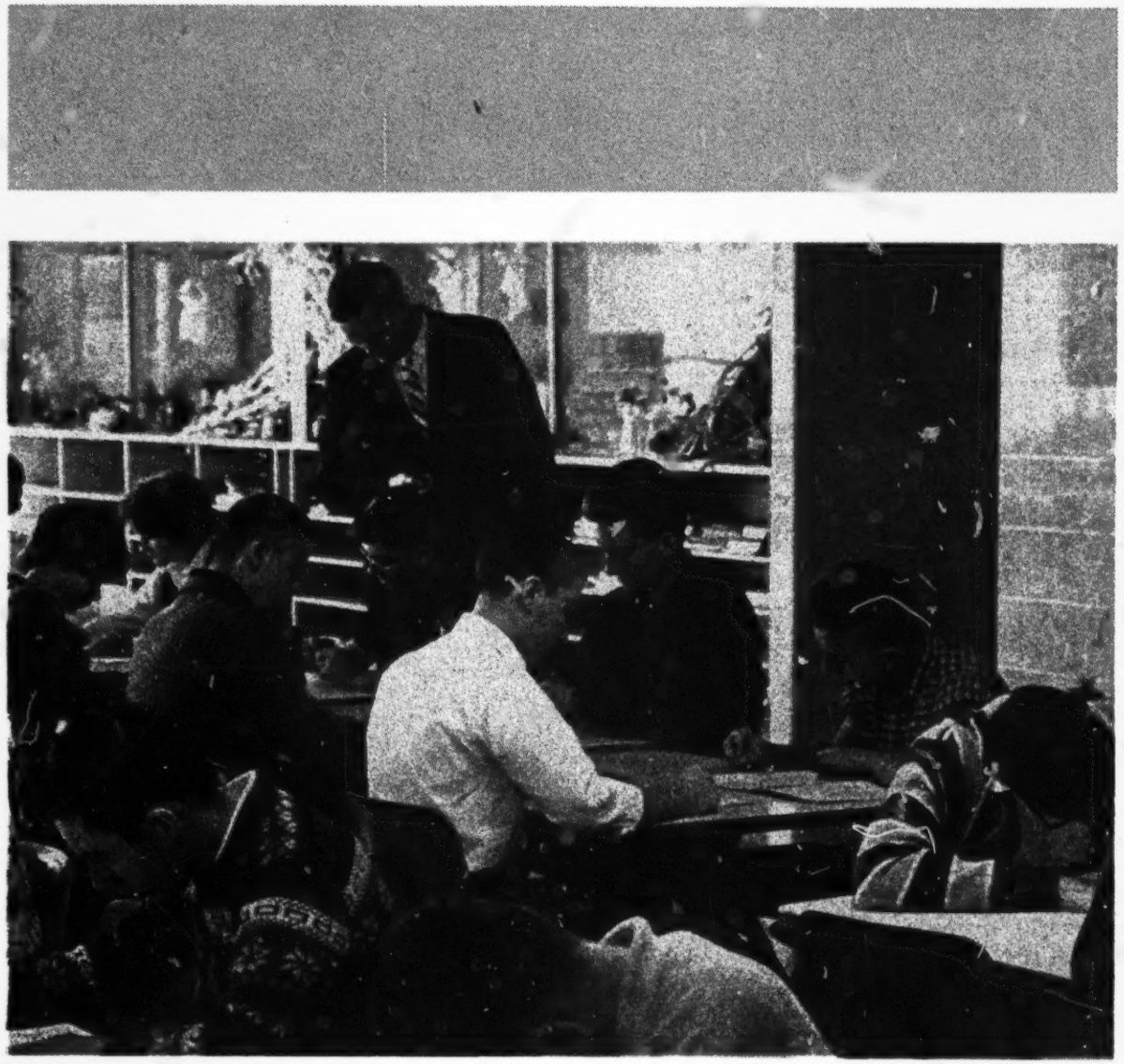
The core program was evaluated by informal observation and teacher-prepared tests. Teachers responded to questionnaires covering such points as these:

1. **Does the pupil understand the responsibilities and privileges of a good citizen?**
   a. **Does he give intelligent support to elected classroom leaders?**
   b. **Does he show by his actions and speech that he respects people of different race, religion or class?**

There are indications that the television core program stimulated change. The children's librarian reported heavy demands for books recommended on television lessons. In some instances, pupils purchased books unavailable at the library. Many parents have watched core programs and made a point of praising the work of the studio teacher. Art and craft work has increased in core classes, and walls bare before television are now filled with pupils' work. Parents take their children to historic places in the county and help them with special projects growing out of the core program.

The value of these experiences is difficult to measure. Certain objective tests were given, however, as part of the general county testing program. Table XIV shows the results in Hagerstown schools. The comparatively small progress in certain areas—such as reading, spelling, and language usage—indicate that the core program must be carefully examined in terms of emphasis.

Table XV covers the same material as Table XIV, but for rural schools. Rural pupils tested in September, 1957, and May, 1958, had not received any television instruction, while those tested in May, 1961, had had three successive years of teaching by television in core and other subjects. Small gains occurred. The test results indicate that the program needs attention since the achievement level is lower than might be expected.



TABLES XIV - XV	CORE — ENGLISH AND SOCIAL STUDIES											
	HAGERSTOWN SCHOOLS						RURAL SCHOOLS					
GRADE 8	SEPT., 1957		MAY, 1958		MAY ,1961		SEPT., 1957		MAY, 1958		MAY, 1961	
	GRADE EQUIVALENT	PERCENTILE	GRADE EQUIVALENT	PERCENTILE	GRADE EQUIVALENT	PERCENTILE	GRADE EQUIVALENT	PERCENTILE	GRADE EQUIVALENT	PERCENTILE	GRADE EQUIVALENT	PERCENTILE
VOCABULARY	7.59	(23)	8.13	(23)	8.44	(35)	7.06	(10)	7.30	(8)	7.89	(16)
READING COMPREHENSION	7.69	(19)	8.26	(18)	8.46	(24)	7.29	(10)	7.63	(8)	8.08	(14)
SPELLING	7.56	(15)	8.18	(22)	8.61	(33)	7.17	(10)	8.05	(15)	8.14	(20)
CAPITALIZATION	8.10	(48)	8.65	(50)	9.18	(72)	7.37	(16)	7.94	(19)	8.38	(37)
PUNCTUATION	7.44	(21)	7.98	(29)	8.60	(55)	6.93	(10)	7.63	(19)	7.82	(24)
USAGE	7.37	(17)	7.89	(17)	8.27	(29)	6.67	(7)	7.47	(10)	7.65	(13)
MAP READING	7.95	(31)	8.52	(24)	8.86	(44)	7.65	(17)	7.99	(8)	8.49	(23)
READING GRAPHS AND TABLES	7.79	(28)	8.52	(27)	8.76	(29)	7.51	(16)	7.93	(16)	8.20	(22)
KNOWLEDGE AND USE OF REFERENCE MATERIAL	7.97	(39)	8.66	(43)	8.93	(57)	7.55	(18)	8.09	(16)	8.47	(31)

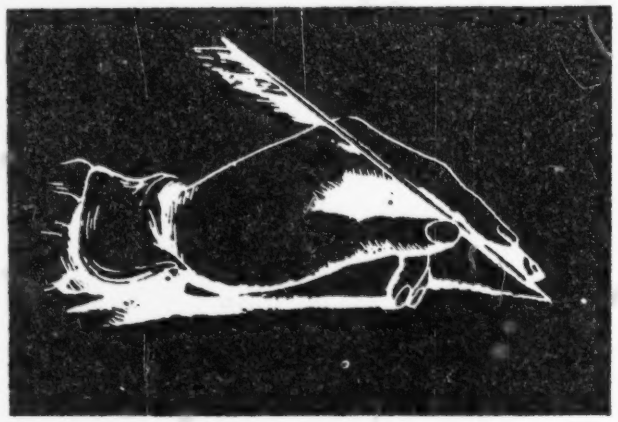
U.S. HISTORY

United States History, a required course in the eleventh grade, was taught by television throughout the five-year project. It was the only history course so taught.

The Crary American History Test was used to measure achievement, despite the fact that it did not parallel the course. The test was given in May, 1958, and in May and September of the 1958-1959, 1959-1960, and 1960-1961 school years. Table XVI shows the results. The "A" schools began receiving television in September, 1956, and the "B" schools in September, 1958.

Table XVI shows an improvement between 1958 and 1961 which is statistically significant even after adjustments for differences in mental ability. Both groups gained least during 1959-1960, a period when the television course was being revised. Achievement reached a peak under the revamped course in 1960-1961. During the first four years, the television lessons occupied half of each period and classroom work the other half. In 1960-1961, the schedule was changed to provide three full periods of television and two of classroom work each week. News events broadcasts over regular commercial television channels were utilized during the course.

TABLE XVI	GRADE ELEVEN — U. S. HISTORY			
"A" SCHOOLS (TELEVISION USED DURING ALL YEARS)				
MEANS (MAY)	1958	1959	1960	1961
MENTAL ABILITY	102.11	102.32	102.89	102.75
U.S. HISTORY (PERCENTILE)	39	52	45	54
U.S. HISTORY (SCORE)	100.86	105.15	103.11	105.71
"B" SCHOOLS (TELEVISION USED DURING LAST THREE YEARS)				
MENTAL ABILITY	90.27	96.77	92.29	93.34
U.S. HISTORY (PERCENTILE)	28	45	46	50
U.S. HISTORY (SCORE)	96.98	103.11	103.24	104.26

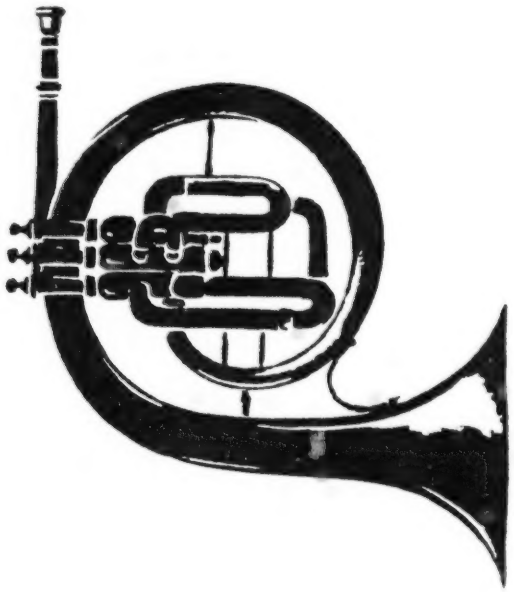


ENGLISH—GRADE TWELVE

For the first three years of high school, all English courses are taught by the classroom teacher alone. But the required twelfth grade English course was taught by television throughout the project. It was taught in two sections—one (academic English) for those who planned to go on to college, and one for non-academic pupils. The academic English pupils took the Cooperative English Test, and the results are shown in Tables XVII-A and XVII-B. Group "A" schools received television instruction from September, 1956, until the project's end, and group "B" schools beginning in September, 1958. The test was not appropriate for those in the non-academic English classes.

In the 1957-1960 period, English lessons were given to classes ranging in size from twenty-five to ninety. The telecast took half of each period and classroom work the remainder. Beginning in September, 1960, the pupils viewed television lessons in large groups three times weekly and met in small groups for classroom work twice weekly. The 1961 results show improvement in each area over the 1958 "B" school and 1957 "A" school results. But the increase is not statistically significant in every case.

TABLE XVII		"A" SCHOOLS				"B" SCHOOLS			
MEANS (MAY)	1957	1958	1959	1960	1961	1958	1959	1960	1961
MENTAL ABILITY (I.Q.)	106.53	110.60	106.41	108.02	113.27	94.94	98.32	107.72	101.25
MECHANICS OF EXPRESSION (PERCENTILE)	45	74	47	69	75	44	56	68	56
MECHANICS OF EXPRESSION (SCORE)	52.21	59.55	52.73	57.98	59.81	52.01	54.72	57.66	54.70
EFFECTIVENESS OF EXPRESSION (PER.)	47	75	35	73	76	34	44	62	55
EFFECTIVENESS OF EXPRESSION (SCORE)	52.60	59.61	49.43	59.00	59.91	49.30	51.69	56.33	54.46
SPEED OF COMPREHENSION (PERCENTILE)	60	68	48	58	67	12	22	29	30
SPEED OF COMPREHENSION (SCORE)	56.34	58.40	53.41	55.84	58.00	42.60	46.39	48.46	48.73
VOCABULARY (PERCENTILE)	31	43	27	39	44	39	51	54	53
VOCABULARY (SCORE)	48.99	52.19	47.94	51.06	52.47	50.92	53.97	54.70	54.38
LEVEL OF COMPREHENSION (PERCENTILE)	44	59	32	56	67	27	31	53	48
LEVEL OF COMPREHENSION (SCORE)	52.54	55.94	49.31	55.16	58.00	47.94	48.94	54.50	53.44



ART AND MUSIC

Art and music were taught on television in grades one through six through most of the project. It was apparent to any observer that pupils and teachers enjoyed the lessons and profited from them. Measuring achievement objectively in these courses is always a problem, but in the project's second year an attempt, however imperfect, was made.

Two groups of third and sixth grade children were tested. One group came from schools that received television, the other from outlying schools that did not. Pupils were matched on the basis of intelligence, reading ability, and achievement test results. There were about 100 pupils in each group.

The third grade art test included questions on shading, shape, direction of light, distance, texture, and mixing colors. Pupils who had received televised art lessons for one year scored several points higher than pupils who had not received television. The difference was reliably greater than chance.

The sixth grade test included questions on form, mosaics, papier maché, colors, line and perspective; and an exercise in completing facial features on an outlined head. The television pupils achieved one raw score point higher than the others—a difference no greater than chance.

The third grade music test required pupils to differentiate between low and high notes, smooth and skipping music, fast and slow selections, and to identify instruments. Television pupils achieved four raw score points higher than the others, a difference well beyond chance.

The sixth grade music test included questions on instruments and rhythm patterns and identification of tunes and notes. Television pupils again scored four points higher than other pupils.

In general, these tests indicated that television pupils performed more successfully on art and music tests than did their counterparts in the conventional classroom.

Teachers agree that pupils grew in performance skills and appreciation in both subjects throughout the project.

CONVERSATIONAL FRENCH

Conversational French lessons for pupils in grades four, five and six began in September, 1959. An informal test was given pupils in all three grades in May, 1960, and while those in grades four and six achieved equally well, grade five pupils scored lowest. No reasonable explanation for the difference was found.

Pupils in the French program show a high degree of interest. They also show a more ready acceptance of foreign languages than do older pupils. Reports from one of the county's largest high schools indicate that pupils who had a single year of conversational French in grade six had not forgotten pronunciation when they reached high school. And where high school pupils previously unfamiliar with a foreign language laughed at or hesitated to attempt strange intonations, those who had been introduced to them in elementary school had no such problems.

EVALUATION SUMMARY

Is television responsible for the achievement gains shown in the testing program? The Washington County staff does not claim that television per se is responsible for all the improvement in pupil achievement that occurred, but feels it has contributed to an overall situation that made growth possible.

1. It focused attention on problems in a way never before possible.

2. It stimulated team work and planning.

3. It created interest in curriculum development and teaching procedures.

4. It required pupils to assume more responsibility.

5. Parents took a greater interest than formerly in the school program and in the progress of their children.

THE PLACE OF TELEVISION IN THE SCHOOL PROGRAM

PART III

DURING THE TELECAST

Pupil Activity

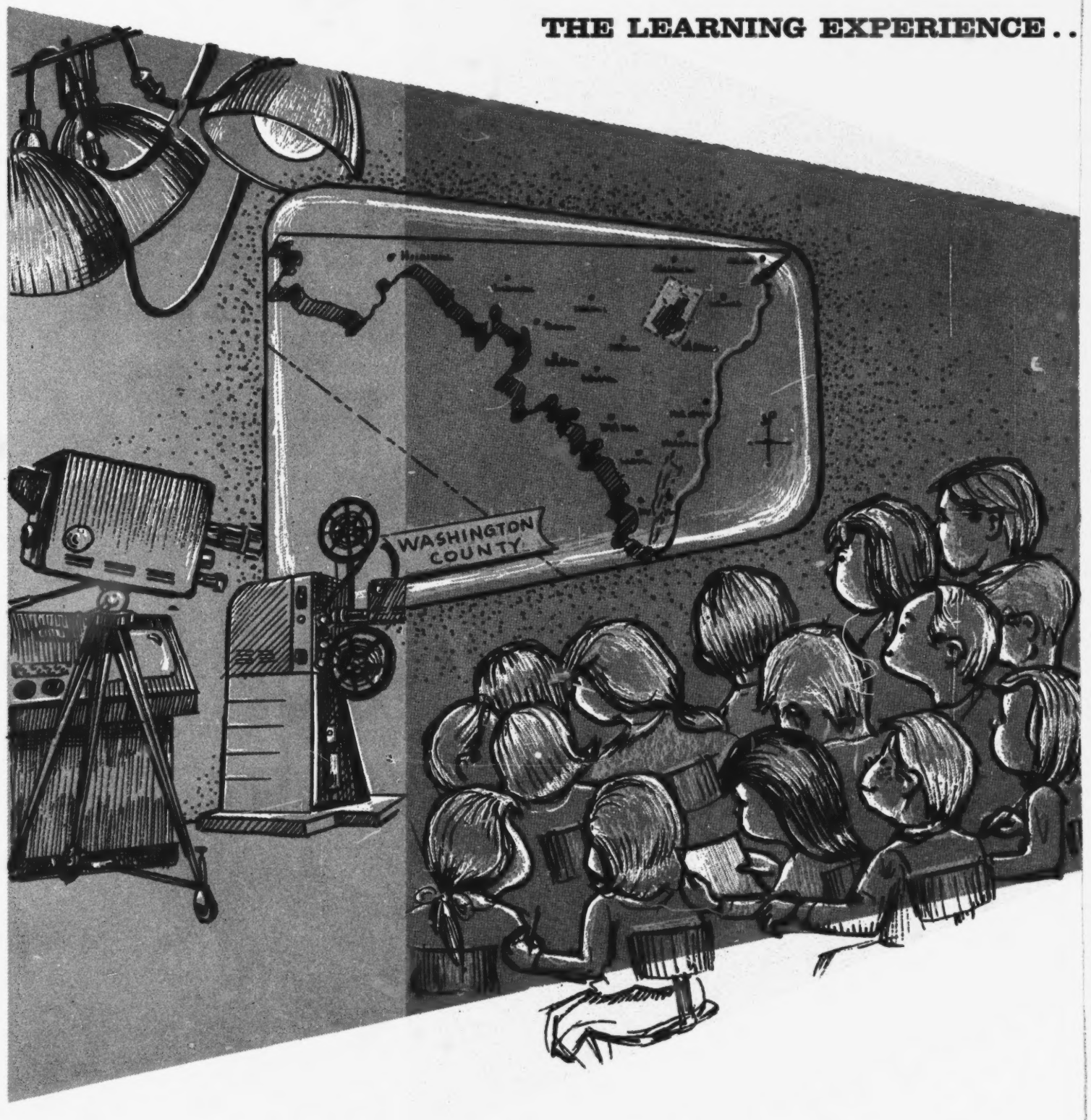
- Listening
- Observing
- Taking notes
- Following directions
- Organizing information
- Raising questions
- Weighing alternatives
- Withholding judgment
- Noting need for more information
- Reaching tentative conclusions

Television is used to:

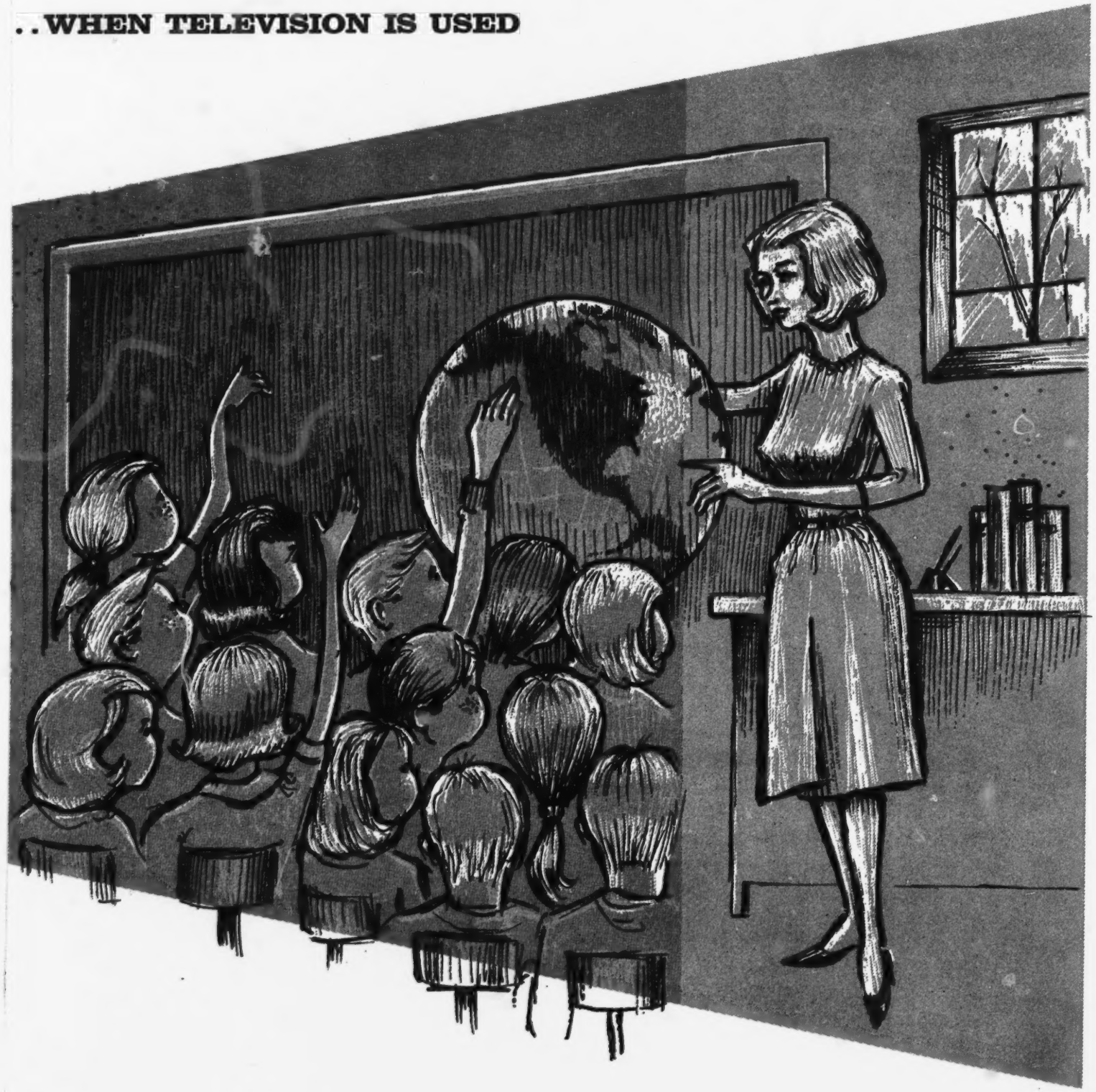
- Present viewpoints
- Create interests
- Provide the latest information
- Dramatize aspects of the lesson
- Direct attention
- Pace the learning activities
- Utilize special talents
- Enlarge objects
- Present ideas visually
- Bring immediate community and world events into the classroom
- Provide in-service education for teachers

The television lesson must be accurate, interesting, useful, pertinent — a regular part of the course. It takes advantage of the kinds of learning experiences that can be handled effectively by the television process.

THE LEARNING EXPERIENCE . .



..WHEN TELEVISION IS USED



AFTER THE TELECAST

Pupil Activity

- Asking and answering questions
- Discussing
- Practicing
- Performing experiments
- Investigating (individual and group)
- Reading
- Working on projects
- Making applications
- Creating
- Evaluating

Classroom time is used to:

- Express ideas
- Discuss alternatives
- Clarify misunderstandings
- Develop group plans
- Arrive at decisions
- Guide pupil growth
- Make practical applications
- Provide opportunity for individual and group projects
- Demonstrate and experiment
- Test pupil achievement
- Evaluate pupil learning

The classroom lesson must be interesting, useful, pertinent, and take advantage of the kinds of learning experiences that can be handled effectively in face-to-face groups.

Undoubtedly, television has a place in the instructional program of the school. What this place will ultimately be is now being determined as school staffs increase their experience with the medium. The following statements explain a point of view that represents the Washington County feeling about the use of television for instruction.

1. Learning is not a simple process. It involves more than observing, reading about, being told or memorizing. The learner must identify himself with what is being learned and must understand. He must be an active participant—doing things. He needs the help of trained personnel and of other resources to achieve this understanding.

2. Since education deals with human growth and development, it is only natural that the greatest source of assistance to the pupil has always been another person—the teacher. This human resource is and will continue to be of the greatest importance in the school program.

3. Through the ages the school has not had very many resources to assist in helping pupils learn. But resources were found; and gradually paper, slates, pencils, pens, chalkboards, the printed word, pictures, maps became classroom necessities. Such innovations were sometimes opposed on the ground that they would lessen the child's ability to use and develop one of man's greatest assets—memory. Once their great value, however, was realized they were accepted. The book, especially, has become an essential resource that provides contact with the past and points the way to the future.

4. No one can learn for an individual. He must do it himself. He does the learning. Schools and teachers can only arrange for him to learn and help him learn. They provide the environment, the challenge, the program and the opportunity to acquire pertinent information, develop skills and techniques, and build personal values and understandings.

5. Pupils learn in many ways. There is no one way to learn. The school has developed an effective procedure in setting up class groups which provide a face-to-face situation between the teacher and the pupils. The give and take of class discussion and teacher guidance have proved to be a practical and very effective way to organize and carry on the learning process. But it is not the only way to learn, for pupils can profit from other kinds of experiences during a part of the school day.

6. Radio, television and other mass communication media can be used as learning resources. For example, these media can stimulate the learner to listen and observe carefully, and to sustain attention, thus allowing him to follow directions more accurately and to organize his information more thoroughly. By their nature the media require the learner to identify topics for further study. He must withhold judgment, and this causes him to assume greater responsibility in figuring things out for himself. The latest information concerning a subject can be presented, outstanding authorities can be brought into the classroom, and current events can be seen and heard as they

occur. Visual aids and equipment beyond the range of the average school can conveniently become part of the teaching situation within the classroom.

7. Television and other such modern aids to education are resources—they do not replace the teacher. They place effective means in the hands of the teacher to do many things that otherwise are not likely to be done. They provide additional ways to help pupils learn. Cameras and receiving sets are pieces of equipment, not teachers. Television is a conveyor of ideas, not a creator. It transmits instantly the spoken or written word, the picture, the sights, and sounds, the action of events as they take place. It enables the viewer to hear as well as to see what occurs. A lesson does not automatically become better, more forceful, or challenging because it is telecast. School personnel do the planning and teaching. What is taught and how it is taught depend on their cooperative efforts. Careful planning and continuous evaluation are necessary because the value of television is directly related to the way it is used.

8. A lesson broadcast by radio or television is a different kind of learning experience from a classroom recitation. Pupils do not answer questions as part of classroom discussion. They participate in a different way. They seldom answer aloud; they think along with the teacher —not as a group, but as individuals. The teacher presents information, raises questions, and suggests activities to be carried on by individual study. The pupil must listen, observe, take notes, figure some things out for himself, and follow up on his own.

9. Television easily places at the disposal of the teacher procedures and techniques that would be difficult or impossible to employ in a face-to-face situation. The pupil's attention can be directed to the exact point of emphasis and the superfluous and extraneous eliminated; objects can be enlarged or reduced. The teacher can be seen in many perspectives and can maintain eye-to-eye contact with pupils.

10. When modern aids are used in the educational program, what is done must be an integral part of the total program. They must contribute to the achievement of the aims of the school and must not be supplementary fringe programs that may be nice to have but for which there is little real need or even time available in the busy school schedule.

Washington County personnel feel, therefore, that the instructional program of a school system is handicapped without the use of television as a resource. County officials would want to continue using television even if by some stroke of magic it had all the good teachers, classroom space and instructional materials that could be desired.

The project has shown in the many ways described in this report that television can add a new dimension to the instructional program. Through the use of visuals and other techniques unique to television, classroom television provides experiences for Washington County pupils that could not be achieved in any other way.

CREDITS

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